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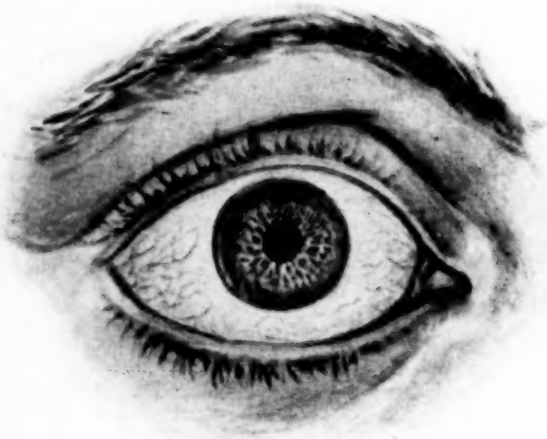

PERIPHERAL PIGMENTATION OF THE CORNEA (HOLLOWAY AND DE LONG).
FIG. 1. CASE DESCRIBED IN 1914.

PERIPHERAL PIGMENTATION OF THE CORNEA (HOLLOWAY AND DE LONG).
FIG. 2. NEW CASE NOW DESCRIBED.

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PERIPHERAL PIGMENTATION OF THE CORNEA ASSOCIATED WITH LENTICULAR DEGENERATION OF THE PSEUDOSCLEROSIS TYPE

T. B. HOLLOWAY, M.D., and P. DE LONG, M.D.

PHILADELPHIA

Reference is made to a case of marginal pigmentation of the cornea published by one of the present authors in 1914, and which is illustrated in figure one of the accompanying color plate. In a new case here described, and illustrated in figure two of the color plate, the disease of the central nervous system known as hepatolenticular degeneration, or as pseudosclerosis (from its resemblance to multiple sclerosis), was again complicated by marginal pigmentation of the cornea. In the earlier case the pigmentation formed a complete ring, in the new case it appeared only in the upper and lower quadrants of the cornea. Slit-lamp examination is necessary for satisfactory study of the deposit, which has been variously reported as occurring in Descemet's membrane or in other layers of the cornea, and as to the exact composition of which no satisfactory conclusion has been reached. From the neurological department of the Philadelphia general hospital and the department of ophthalmology of the medical school of the University of Pennsylvania. Read before the American Ophthalmological Society, June 10 to 12, 1929, Hot Springs, Virginia.

Disease of the lenticular nucleus may produce a number of recognized clinical conditions, but concerning it much is still unknown and, owing to what might be regarded as transitional cases, considerable confusion still exists. Spiller, writing in 1916, assigned the following affections to disease of this nucleus: progressive lenticular degeneration (Wilson's disease), pseudosclerosis, Huntingdon's chorea, Parkinson's disease, spastic pseudobulbar paralysis with contractions and choreoathetoid movements of Oppenheim and Vogt, Oppenheim's dystonia musculorum deformans, progressive athetosis, Bechterew's hemitonia apoplectica, and certain forms of carbon monoxide poisoning.

The contribution of Jakob concerning the anatomy, clinical syndromes, and physiology of the extrapyramidal system would prove of real value to those particularly interested. Two of the affections in the group just referred to, namely Wilson's disease and pseudosclerosis, have been associated at times with a characteristic peripheral pigmentation of the cornea, which, so far as our knowledge is concerned, is distinctive from that produced by any other affection, if we exclude several cases in which one or the other of these two conditions might, in a certain sense, be regarded as having been imminent or likely to develop. The confusion persisting up to this time in regard to disease of the lenticular ganglion may ultimately necessitate some qualifying statement.

In 1914 one of us (Holloway) placed on record the history of a case belonging to this group, under the title of "Peripheral pigmentation of the cornea associated with symptoms simulating multiple sclerosis". As this paper was in the editor's hands awaiting publication for over a year, similar cases of corneal pigmentation reported in 1914 by Oppenheim, Rausch, and Schilder, and by Strümpell and Handmann, could not be referred to, and but brief reference could be made to the reports made in 1913 by Westphal and Rümpel. At that time the histories of Kayser, Salus, and Fleischer were detailed, and the case then described constituted the sixth on record, so far as the available literature was concerned.

Since that time Hall's monograph

has been published (1921). More recently (1925 and 1926) Barnes and Hurst have contributed their excellent discussion concerning these cases; and their report included the slit-lamp examination made by Butler, which he has referred to elsewhere.

Last year another case of this character came under our observation in the neurological ward of the Philadelphia General hospital on the service of Dr. Charles Potts, and we are indebted to him and to his associate Dr. W. B. Stewart for the accompanying neurological notes and for the privilege of making this report.

Case: M. K., female, Russian, aged thirty-four years, was admitted to the neurological ward of the Philadephia General hospital on April 24, 1915, complaining of generalized tremor. She stated that she had been perfectly well until six months before her admission, when she was badly frightened by an intoxicated man. Shortly after this she was seized by attacks of trembling, involving her entire body. These attacks increased in frequency and duration until, at the time of her admission, the tremor was almost constant. She complained of no other physical disability. She had had the usual diseases of childhood, and, aside from the fact that her father was a habitual drunkard, her family history was negative. She was a cigar worker by trade.

Physical examination revealed a well developed and nourished white adult, with a mentality slightly below normal, showing no evidence of visceral disease. There was no tremor when the patient was at rest, but upon the slightest mental or physical effort she showed coarse clonic tremors of the head, trunk, arms, and legs. This tremor was proximal rather than distal, involving elbows and knees rather than fingers and toes. There was little if any muscular rigidity. The reflexes were not exaggerated, and her abdominal reflexes were present. There was no Babinski or ankle clonus. When walking there was a tendency to lean forward, and there were backward and forward motions of her head and at times of her trunk, with a coarse tremor of one arm and then the other, and sometimes of both. She showed no ataxia, her cranial nerves were negative, and there were no abnormalities in sensation. Since she has been in the hospital she has become progressively worse. The tremor of her legs became so violent that she was unable to walk, although there was no loss of actual muscular strength. Her speech became hesitant and more or less explosive, but without evidence of scanning, and it was not monotonous. Indeed, the difficulty seemed to be with breath control rather than with articulation. She slowly deteriorated mentally, and showed great emotional instability. There was, however, no definite evidence of psychosis. She has had no intercurrent illness since her admission to the hospital. There has been no symptom suggestive of liver disease, and her sugar tolerance has been normal. In 1920 she had a normal pregnancy and was delivered of a normal child. Her blood chemistry has always been normal. The serology of her blood and spinal fluid has been negative and her colloidal gold curve normal.

At present she shows little if any tremor when at rest, but upon physical or mental effort her tremor is violent and of the type described above. Her muscular strength is good and there is no rigidity. Her reflexes are present but not exaggerated. There is no enlargement of the spleen and no demonstrable abnormalities of the liver. Examination of her eyes on several occasions showed no nystagmus, no abnormality in the extraocular movements, nor pathology in the nerve head.

In May, 1928, the palpebral fissures were equal, the orbicularis of each eye was intact, the ocular rotations were full, and there was no nystagmus. Intraocularly the media were clear, each disc showed good capillarity, and there was no suggestion of neuritis, choking, or atrophy. No pathologic lesions could be noted elsewhere in the eyegrounds. Owing to the type of tremor present, no satisfactory perimetric examination was possible, but a rough

hand test was normal as well as this could be determined, and no scotoma, at least for red, could be elicited.

With the naked eye one could readily note a greenish-brown or smoky discoloration at the limbus of each eye. With the Zeiss loupe this discoloration appeared as smoky crescents above and below, extending in the right eye from the 10:30 to the 2 o'clock position, and from 4 to 8:30 o'clock, and in the left eye from 9:30 to 2 o'clock and from 4 to 8:30 o'clock. Its greatest width of about 2 mm. was in the vertical meridian. The pigmentation was noted as deep but its exact position could not be definitely determined. In our absence from town Dr. Cowan kindly examined the patient with the slit-lamp, and he reported that the pigmentation involved Descemet's membrane. In color it was brown, and he believed the greenish tinge was dependent upon the underlying blue iris. The pigmentation was not profuse, did not extend to the angle, and faded out toward the pupil. The lens was not involved.

Within the past month this patient has been examined again, and the eyes remain essentially the same. The involvement of Descemet's membrane by the granular brownish pigmentation was well shown, as was the fading out toward the central part of the cornea. In these cases in which the intention tremor is marked, this type of examination is difficult, and prolonged study is not possible.

Comments: The first patient showing this type of corneal pigmentation was described by Kayser in 1902; only a brief report was made, and the case was regarded as one of multiple sclerosis. Fleischer's cases were described as pseudosclerosis. The earlier report made by one of the present writers concerning this pigmentation was written in 1913, and the year before that Wilson's excellent monograph appeared describing a definite syndrome in the course of progressive lenticular degeneration. He referred to this as a disease which occurs in young people, which is often familial, but not congenital or hereditary; it is essentially and chiefly a disease of the extrapyramidal motor system, and is characterized by involuntary movements, usually of the nature of tremor, dysarthria, dysphagia, muscular weakness, spasticity, and contractures, with progressive emaciation; with these may be associated emotionalism and certain symptoms of a mental nature. It is progressive and, after a longer or shorter period, fatal. Pathologically it is characterized predominantly by bilateral degeneration of the lenticular nucleus, and in addition cirrhosis of the liver is constantly found, the latter morbid condition rarely if ever giving rise to symptoms during the life of the patient."

Wilson thought that in connection with the hepatic cirrhosis, which did not produce any clinical signs during the life of the patient, a toxin was probably generated which exerted a selective action on the cells and fibers of the lenticular nucleus.

While we could exclude multiple sclerosis in the patient described in 1913, it was too early to properly classify it in view of the group of cases just described by Wilson, so the title above referred to was utilized.

In these cases as a group, cirrhosis of the liver has been found at autopsy, and this frequently persisted for a long period for time without clinical or laboratory evidences referable to it. On the other hand a frank glycosuria may be present or, as was found in Holloway's and other cases, a decrease in the sugar tolerance. Enlargement of the spleen and pigmentation of the skin have also been recorded in certain instances. The patients of Fleischer and Strümpell complained of hemeralopia. In view of the constant involvement of the liver and its probable direct relation to the subsequent train of symptoms, Hall has grouped these extrapyramidal tract cases under the title of hepatolenticular degeneration, and Barnes and Hurst have likewise adopted this desigtion. These two authors, in speaking of the primary importance of the liver, suggest that "in these cases there flourishes amongst the flora of the alimentary tract some organism which

bursts into activity at intermittent periods, in the same way as we believe does the bacillus typhosus in a typhoid carrier; that its toxins pass through the portal system to the liver, whose cells in attempting to destroy these deleterious substances and so prevent a poisoning of the whole system are themselves so damaged in the effort that an acute hepatitis occurs in which many liver cells die and others are put out of action for the time being. The toxin causing lenticular destruction might thus be either the primary alimentary one which escapes through the damaged liver where filtration capacity is in abeyance, or arises from the dying liver cells themselves. On the whole we favor the former alternative."

As to eyes, Hall tabulated sixty-eight cases which he regarded as dependent upon hepatolenticular degeneration, and pigmentation was found in twenty-one instances; it was not referred to in thirty-one cases. Among thirty-seven cases, he definitely classified sixteen in the pseudosclerosis group, and all of these had the pigmentation; nine were of the Wilson type and four of these gave the characteristic staining, while but one example was found among twelve cases that could not be definitely placed in either group.

The pigmentation in these cases may form either a complete ring, as has been the case with most of the patients described, or it may be incomplete, as in the case here recorded. It is brownish-green in color, presents more or less of a smoky hue, and fades out gradually toward the center of the cornea. Needless to say it is usually a bilateral manifestation. When well marked it can be seen with the naked eye, and becomes quite apparent with a loupe, when the pigmentation can be definitely noted to be a deep one, but for accurate determination slit-lamp illumination is essential. For example during the winter of 1912 and 1913, owing to the inadequate illumination then provided for the Zeiss corneal microscope, I attached to a portable arm a Ziegler operating lamp which was equipped with a Nernst filament, and was using this for the source of illumination with the corneal microscope. With this equipment it was possible to make out a faintly granular brownish deposit involving the deepest layers of the cornea, but its definite character and position could not be determined as can now be done with the slit-lamp.

Barnes and Hurst have stressed the importance of slit-lamp examination. Butler, who examined one of their patients with unilateral pigmentation, stated that, "examined with the focal illumination of a half-watt lamp and the simple loupe magnifying about six times, there was no sign of the ring". However, with suitable manipulation "there was a most unmistakable golden glow. But for the difficulty in the examination I have no doubt that I should have seen the actual ring with the loupe." With slit-lamp illumination Butler definitely placed the type of the lesion.

These points are brought out not because these cases have not been subjected to these examinations when seen by the ophthalmologist, but to reinforce the belief of Barnes and Hurst that all cases of this character should be subjected to slit-lamp observations before definitely stating that this type of pigmentation does not exist. Such observations are not only necessary for detecting the lesion, but they are necessary for purposes of elimination.

For example, within the past month a patient with probable pseudosclerosis was examined and by careful manipulation a faint suggestion of a smoky ring could be made out at the upper limbus. Two subsequent slit-lamp examinations definitely excluded the deep type of pigmentation, but instead there was a superficial epithelial change with very faintly marked vascular loops. It is difficult to say why this smoky appearance was present, but these findings were confirmed by two of the members of my staff.

As would be expected in an affection of this character, the literature now contains a number of necropsy reports, in fact the majority of the case histories recorded have been accompanied by

such findings. Curiously enough, while neurologists stress the importance of this corneal sign, one not infrequently finds the most detailed description concerning all the other organs concerned, but no microscopic eye examination. Despite this, a sufficient number of eyes have been examined microscopically to determine position of pigmentation.

In Fleischer's case the pigment was situated in Descemet's membrane and was made up of rounded and angular greenish-brown granules that appeared refractile at a certain angle. In addition to this the membrane of Bruch was pigmented, but the capsule of the lens remained free. In the microscopic reports of Hall and of Barnes and Hurst the site of the corneal pigmentation was identical with that described by Fleischer, and in all three instances the pigmentation failed to involve the endothelial lining or the stroma of the cornea, and it did not extend entirely to the angle of the anterior chamber. In the girl described by Greenfield, Poynton, and Walshe the findings were the same.

Finally, there was no variation in the position of the pigment in the eye studied by Archangelsky, an abstract of whose report has just been made available. Fleischer's case is the only one in which pigmentation of the membrane of Bruch was found.

Character of the pigment: Fleischer's patient showed a different pigmentation of certain of the internal organs, and chemical tests applied to small pieces of the kidney and spleen seemed to show the presence of silver. Its exact character, however, could not be definitely determined.

In 1913 Rümpel, after detailed study, came to the conclusion that the pigment was silver. He believed the hepatic changes depended upon faulty fetal development which resulted in functional insufficiency, which in turn gave rise to disturbances of metabolism and autointoxication. Hall took exception to the conclusions of Rümpel in regard to the silver content of the organs, and excluded it as a possibility for the corneal pigmentation. He regarded this as endogenous and as derived from hemoglobin, but it was not hemotoidin or hemosiderin, nor was it a lipochrome.

Barnes and Hurst carried out the same careful chemical tests as were made by Fleischer and Hall, and submitted the following table comparing the results of the latter with their own:

Reagent	Fleischer and Hall	Barnes and Hurst
25 percent HCl	Easily soluble	Not completely soluble in three days
H_2SO_4	Insoluble	Insoluble
Gmelin's test	Negative	Negative
Glacial acetic acid	Insoluble	Insoluble
Alkalies	Unaffected by 33 percent KOH	Soluble in three days in five percent NaOH
Ammonia	Insoluble	Insoluble
Hydrogen peroxide	Not altered	Decolorized
Ammonium sulphide	Easily soluble	Insoluble in 24 hours
Iron reaction	Negative	Negative
Alcoholic iodine followed by dilute ammonia	Decolorized	Only partly decolorized
Stains	Not colored by Sudan, neutral red, or thionin	Not colored by scarlet red or neutral red

They conclude that in none of these cases have the reactions corresponded with any normal body pigment, or to pigment found in the commoner pathologic conditions. They also exclude silver and manganese.

In 1925 Kestenbaum, in referring to a double ring that was incomplete, cited the findings of Elschnig and Kubik, who, after insertion of a spectroscope in the ocular of the corneal microscope, found resorption bands resembling those of bilirubin.

In the same year Hessburg found in a case of pseudosclerosis a brownish-green pigmentation of the scleral con-

junctiva in association with the Fleischer ring. In the left eye there was a coloboma of the iris and lens. At the lens margin, with the slit-lamp, was found a distinct fine greenish stripe which corresponded in details to the corneal ring. A microspectroscopic examination was made with a binocular microscope, and when focusing on the pigmented corneal ring a resorption band between the green and the blue corresponding with urobilin was distinctly seen. While not so clearly noted, a band of the same character was observed over the pigmentation at the lens border. Comparative studies were made with solutions of undecomposed bile, bilirubin, and urobilin, and the ocular spectra corresponded with the last named solution.

Twelmeyer, in a similar examination of his case, failed to find such bands, but Cords, describing in 1927 a typical instance of this type of pigmentation, stated that according to Hessburg's most recent studies the pigment consisted of bilirubin. Still more recently Vogt has reviewed the character of the corneal pigmentation, and had discussed the so called copper cataract which has been noted in these cases by Siemerling and Oloff, Jess, and himself. After referring to the findings of both silver and copper in the internal organs in Rümpel's case, he concluded from this and his own studies that the pigmentation of Descemet's membrane was due to colloidal silver and that the lens pigmentation (copper cataract) corresponded with the finding of copper in the liver.

With these findings before us it probably would be wise to await further confirmation and research before coming to any definite conclusion as to the exact character of the pigment present in these cases. But we believe with Vogt that in all future cases a most thorough histologic and chemical examination of the internal organs should be made, especially of the liver and kidneys.

1819 Chestnut street.

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PATHOLOGICAL DIMPLES ("DELLEN")* OF THE CORNEA

DR. ADALBERT FUCHS
VIENNA, AUSTRIA

In 1911 Ernst Fuchs described as "Dellen" (dimples) saucer-like excavations at the margin of the cornea, usually forming ellipses parallel with the limbus. These dimples cause little disturbance, and rarely last more than forty-eight hours. They are associated with swelling at the limbus from various causes, may occur with hemeralopia or paralytic lagophthalmus, may follow administration of cocaine or operation for cataract, or may appear spontaneously in old people. The present writer contributes some new clinical details and the anatomical findings in a personal case. From the ophthalmological department of the Allgemeine Poliklinik, Vienna.

In 1911 E. Fuchs described as "Dellen" (dimples) of the cornea a clinical picture, apparently unknown hitherto to most oculists, although interesting because of its obscure pathogenesis.

According to E. Fuchs these dimples are shallow, saucer-like excavations at the margin of the cornea. Their borders are clearly defined, not edged but buffed, steep in the cornea and flat in the limbus, into which the deepening often extends. In most cases the dimple is seated at the temporal margin of the cornea, forming an ellipse parallel to the limbus and extending 1.2 mm. vertically and 2.5 to 3.5 mm. horizontally. The floor of the dimple exhibits a faint opacity with a silvery and slightly warty reflex. The deepest parts are more opaque and xerotic, only exceptionally a dimple may be perfectly transparent. Within the dimple the sensibility of the cornea is diminished compared with the rest of the cornea. Adjoining the dimple the marginal network of vascular loops and the corresponding conjunctival vessels are slightly injected.

These dimples cause but little disturbance, some burning for several hours, never real pain. They usually last but a short time, rarely more than forty-eight hours.

As causes of corneal dimples ("Dellen") E. Fuchs mentions the following:

(1) swelling of the limbus with the episcleral tissue (in episcleritis, scleritis fugax, suffusion, angioma, a thick pinguecula, after advancement of a rectus muscle, or after a subconjunctival injection);
(2) administration of cocaine;
(3) operation for cataract;
(4) hemeralopia;
(5) paralytic lagophthalmus;
(6) spontaneous, without known cause, in otherwise normal eyes of old people.

The description of the clinical aspect is completed by a diagram showing the anatomical changes in a dimple found accidentally in an enucleated eye.

My purpose is to call attention to this interesting affection, unknown to some and seen but forgotten by others, by contributing some new clinical details and the anatomical findings in a case of my own.

The dimples have probably escaped the attention of most oculists because of their relative transparency and their seat at the temporal margin of the cornea. When examined the cornea is usually illuminated from the temporal side, in which case the depression does not coincide with the corneal reflex and is therefore easily overlooked, if the periphery of the cornea is not very carefully examined. The dimple escapes observation especially in an eye with a blue iris, in front of which the slight opacity of the dimple does not stand out sufficiently.

The most striking symptom of the dimple is often a shadow seen with focal illumination at the lower part of

* Although the German word "Delle" (plural "Dellen") seems to be in common use, it has escaped mention in every German-English dictionary which the editor has been able to consult. An appropriate alternative translation might be "fovea." By German ophthalmologists the word "Delle" is also applied to the facet remaining after a corneal ulcer.

the iris, and moving on it with the movements of the illuminating light. This moving shadow is very obvious, especially with a light iris. If once seen and its cause found out, which is the depression in the cornea acting as a concave lens, the presence of a dimple, even scarcely opaque, will not be overlooked.

I propose to illustrate this by describing a **case of corneal dimple.**

A stone cutter, seventy-five years old, came to the clinic of Professor Meller, because two days before his right eye had become injected and in the following days had caused a sensation of burning, not exactly of pain. The examination showed an extensive suffusion of the conjunctiva, and at the lower temporal margin of the cornea, next to the limbus, an elongated shallow depression. (Fig. 1.) The floor of this dimple was covered with minute warts and looked dry. The dimple was broader above than below, and its central border was not steep as in most

Fig. 1 (Fuchs). Pathological dimples of the cornea (Dellen). A, subconjunctival hemorrhage.

Fig. 2 (Fuchs). Pathological dimples of the cornea (Dellen).

cases. The pinguecula was but poorly developed. If the cornea was illuminated from the temporal side one saw on the grey iris a striking, dark, sharply defined spot, looking nearly like a pigmented nevus, but recognizable as a shadow by its movement. Two days later the dimple was already very small, the shadow scarcely visible, and next day the dimple had nearly disappeared.

As a rare example of an infiltrated dimple I wish to relate the following **case:**

A woman of twenty-three years had received a subconjunctival injection of ten per cent sodium chloride and cocaine for a chronic iridocyclitis of the right eye, the eye, however, not being injected. After three days there developed in the lower part of the cornea a depression, somewhat distant from the limbus and of an unusual aspect. (Fig. 2.) It was lobulated, reminding one of a dendritic keratitis, with the floor uneven and whitish like a small coated ulcer, so that one would have suspected a small catarrhal ulcer, if there had also been injection of the eye and hyperemia of the iris. The sharp delimitation, the depression, the uneven floor, and the location, however, allowed the diagnosis of a "dimple".

The white coating in this case was due to an unusually advanced desiccation, which had determined a superficial necrosis. On account of this, healing took longer than usual, so that only after five days had the depression disappeared.

This case is unusual because of the lobulated shape of the dimple, the ordinary ones, even if infiltrated, being round or oval. A similar case occurred in a young man, who, after advancement of the rectus muscle, developed a dimple which had many minute infiltrations within it. In this case also the healing took some days more than usual.

I had the opportunity of making sections of an eye removed because of an intraocular tumor, in which a dimple had **developed spontaneously.**

Case history. A man of sixty-seven years had lost the sight of his left eye for five months, because of a sarcoma of the choroid; five days before enucleation the eye had become severely irritated. There existed edema of the lids, chemosis, and high grade injection of the eyeball. The cornea was lusterless, and the anterior chamber contained a black hyphema, delimited above by a brown line.

Next to the limbus and extending downward from the horizontal meridian was located a dimple of 2 by 3 mm. diameter. Its delimitation was steep

toward the center of the cornea and slanting above and below. Its floor was dry and finally warty, with a few fine ridges. It was so opaque that the dimple looked like an ulcer, but immediately before enucleation it had cleared up so much that it was more transparent than the rest of the cornea, which because of increased tension was lusterless and diffusely cloudy. There was no disposition to form grooves of "Gaule" if exposed to the air. The sensitiveness of the cornea was slightly diminished.

On the temporal side of the dimple was a large pinguecula, whilst there was none at the nasal side.

Anatomical examination showed the epithelium to be applied to the cornea everywhere and to stain well. The superficial layers stained much darker than the basal cells, probably because of the action of the fixation fluid. To this also the irregular shape of these cells may be due in some measure, as far as it did not already exist during life, contributing to the dulness of the cornea. Especially the nuclei of the basal cells are of very different size, some of them showing mitosis. Between the basal cells many leucocytes are seen, more numerous at the periphery than at the center of the cornea.

Bowman's membrane is normal. The parenchyma of the cornea contains in its peripheral and superficial layers cells of which a part is surely leucocytes, while others possess a nucleus like that of the corneal corpuscles, so that there exists on one hand a slight diffused superficial infiltration, and on the other hand a definite proliferation of corneal corpuscles. At the center of the cornea the leucocytes are rather rare, while the corneal corpuscles are here more numerous, so that in many places one sees between the corneal lamellæ not one but two nuclei resembling those of corneal corpuscles. In the deeper layers of the cornea the corneal corpuscles are absent in places and in the deepest layers there is a long stretch without any. In front of these layers there are smaller areas without nuclei, surrounded by zones with many nuclei. The endothelium has been cast off in some places, while in others there remain a few elongated endothelial cells or islands of them. At the nasal side the endothelium is preserved. The posterior surface of the cornea is covered with blood, pus cells, phagocytes with pigment, and débris of pycnotic nuclei.

The dimple has a horizontal diameter of 1.69 mm. and a vertical diameter of approximately 2 mm. Because the eye had been cut horizontally only the horizontal diameter could be measured, while the vertical one could only be estimated. The temporal margin is 0.68 mm. distant from the end of Bowman's membrane, at a point corresponding anatomically to the limbus. This distance also is only approximate, because the temporal margin is formed by a flat slanting epithelium, so that it is impossible to determine exactly the point where the dimple begins.

I shall describe in the first place a section through the upper margin of the dimple (Fig. 3). From the central parts of the cornea the epithelium gradually thins down to the floor of the dimple. At the first place the basal cells are still distinct, while in the superficial layers of elongated cells the nuclei no longer stain and appear only as shadows containing reddish particles. Toward the deeper parts of the

Fig. 3 (Fuchs). Pathological dimples of the cornea (Dellen). Magnified 105 diameters. The fact that very little depression is visible is due to the curvature of the cornea having been changed in the fixation fluid.

dimple the epithelium is more and more reduced, from 200 μ to 50 μ, and all the cells are elongated and spindle-shaped. Their nuclei are here smaller, thinner, fusiform and highly staining. Toward the limbus the epithelium recovers its normal thickness or even a little more, its structure being somewhat irregular next to the dimple and becoming normal only further to the temporal side.

Like the epithelium, the underlying tissue is also thinner within the area of the depression, Bowman's membrane (B) as well as the corneal lamellæ, which appear denser. The superficial lamellæ are thinner toward the limbus, while the epithelium is thinner toward the central part of the cornea. At the thinnest point Bowman's membrane measures only 9 μ, and toward the center of the cornea 15 μ. So it is evident that the depression is due to thinning of the epithelium and of the superficial layers.

The sections through the central part of the dimple present a different aspect. Within the area of depression the epithelium is seen to be entirely absent in some places, or very thin—9 μ—in others, with nuclei smaller than normal, fusiform, and staining deeply. In other places Bowman's membrane is coated with a layer of 9 to 10 μ, staining very red and showing traces of nuclei, so that it is evident that it is constituted of dead epithelial cells. (Fig. 4, N.) margin of the dimple, ends here abruptly, nearly overhanging. (Fig. 4, P.) At this border the epithelium behaves in an unusual way. Within the normal area, its thickness is approximately 36 μ, then it thins down to 18 μ, with the basal cells becoming less distinct, and again thickens to 45 μ immediately at the border of the dimple. Here one sees the proliferation of the epithelium, manifesting itself by the presence of many small, round nuclei, particularly numerous at the base, so that there is not the normal regular layer of basal cells. A similar condition, reminding one of proliferation, obtains at the limbal border. In these sections Bowman's membrane and the underlying lamellæ are in some places of nearly normal thickness, in other places considerably thinner, and numerous leucocytes underlie Bowman's membrane. This infiltration goes down through nearly a sixth of the thickness of the cornea, and extends toward the center of the cornea only as far as the dimple, viz. to the overhanging border of the epithelium. Here the immigrated leucocytes stain deeply, while in planes where Bowman's membrane lies exposed the leucocytes have lost their staining and appear only as a faintly blue mass between the lamellæ.

Within a small area of 0.51 mm. Bowman's membrane has disappeared entirely, and many leucocytes here lie in

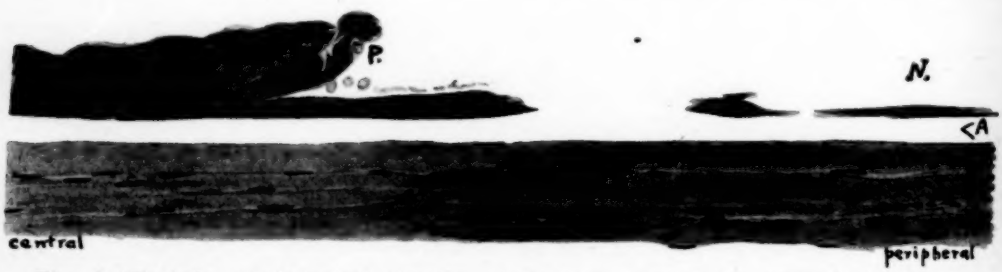

Fig. 4 (Fuchs). Pathological dimples of the cornea (Dellen). Magnified 350 diameters. A, artificial space. P, proliferation of epithelium at the edge of the dimple. N, newly formed and necrotic epithelial cells. B, Bowman's membrane.

The sections above and below show the normal epithelium thinning down gradually, while here we have a sharp border toward the center of the cornea, because the epithelium, thicker at the the superficial layers, so that we have to deal here with a small ulcer (Fig. 5, U.), which occupies the immediate neighborhood of the temporal margin of the dimple.

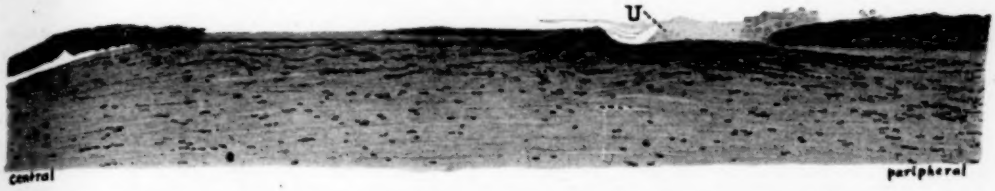

Fig. 5 (Fuchs). Pathological dimples of the cornea (Dellen). Magnified 105 diameters. U, ulcer partly covered by blood.

Yet a few words regarding the other changes in this eyeball. A sarcoma of the choroid of the size of a hazelnut was located on the temporal side next to the papilla, had produced increased tension and hemorrhages, and had eventually become necrotic. By the toxins emanating from the necrotic tumor the iris, ciliary body, retina, and choroid were likewise rendered necrotic, but until the moment of enucleation they had not yet undergone a reactive inflammation, so that the choroid contained but few infiltrating cells.

It is noteworthy that there is a big pinguecula at the temporal side but practically none at the nasal side. From the pinguecula masses of degenerated hyalin fibers of connective tissue advance toward the limbus, separating the epithelium from the underlying tissue, so that there is none of the normal loose subconjunctival tissue within this extensive area, which contains also some hyalin concretions up to 0.13 mm. diameter.

The pinguecula extends with its inferior pole farther down than the dimple, so that the small ulcer within the dimple is below the level of the inferior margin of the pinguecula.

According to the anatomical findings there exists on the one hand a thinning of the epithelium and of the uppermost layers of the cornea, and on the other hand a defect of the epithelium and a real ulcer. The sharp temporal edge of the dimple is due to a step in the epithelium, overhanging the floor. This step is particularly well marked, because by proliferation the epithelium is here thicker than normal.

The above findings remind one of similar prominences of the endothelium at the posterior surface of the cornea*, which, as I have pointed out, may become visible on clinical examination. If, corresponding to an ulcer at the anterior surface of the cornea, the endothelium was cast off, it may proliferate at the margin so as to form a ridge projecting into the anterior chamber. On the one hand the endothelium tends to coat the defect with newly formed endothelial cells, while on the other hand the toxins emanating from the ulcer backward do not allow the endothelial cells to grow over the diseased area.

At the site of the dimple the epithelium behaves in a similar way. Due to a cause to be discussed later, the epithelium is desiccating. The surrounding epithelium tends to cover the defect, but being prevented from doing so it proliferates and thickens at the margin. This is the case only at the temporal margin of the dimple. Above and below, the border gradually becomes flatter, so that clinically as well as anatomicaly there is no sharp delimitation. The difference between the shape of the border on the different sides is due to the fact that the disturbance of nutrition must manifest itself more where the dimple extends farthest from the limbus than on the upper and lower sides. The sharp delimitation of the steep temporal border may be accounted for by the fact that the areas of nutrition, whether controlled by nerves or by the lymph current issuing from the vessels, have sharp limits.

One might be surprised that the ulceration within the dimple escaped clinical examination. The floor of the dimple became gray two days before enucleation, so that an infiltrated dimple was suspected, but the next day the floor, although warty, was again

* Zeit. f. Augenh., 1927, v. 61, p. 11.

transparent in spite of the slight infiltration of the superficial lamellæ.

Is this infiltration dependent on the formation of the dimple, or is it rather due to the necrosis of the uvea and to the general affection of the cornea? The cornea appeared somewhat hazy and lusterless, and exhibited in sections a slight infiltration as a reaction to the necrosis of its deepest layers produced by the cytotoxins of the disintegrating sarcoma. But the ulcer within the dimple has certainly nothing to do with the general affection of the cornea: corresponding to the dimple the deep layers of the cornea are not more affected than elsewhere, while there is no trace of an annular infiltration of the cornea. Nor does there exist an extensive necrosis of the central parts of the cornea, such as often occurs in such cases, but only in some places have the corneal corpuscles perished. The location of the ulcer next to the limbus also speaks against a connection with the general affection of the cornea, because in that event the ulcer should occupy the center. The clinical picture of an infiltrated dimple, as described above, may also occur in cases in which there is no question of suppuration or necrosis of the cornea. In the preceding case the onset of an infiltrated dimple was under observation. The cause of it was partly the considerable chemosis due to necrosis of the tumor, partly the big pinguecula with hyalin concretions, advancing into the limbus.

The fine ridges observed clinically at the floor of the dimple correspond probably to the condition of the epithelium, which in the case of a dimple behaves otherwise than in a case of lagopthalmus. In this the desiccating epithelium is simply thinner and necrotic, and stains deep blue in the specimens. In a dimple we do not in most cases have to deal with a simple necrosis of the epithelial cells; the cells at the floor of the dimple are thin, irregular, elongated but not necrotic, and their small round nuclei prove them to be newly formed cells. While a good part of the epithelial cells perish, others proliferate and form small islands of cells corresponding to the minute warts.

E. Fuchs found in his case only a thinning of the epithelium within the dimple due to thinning of each individual cell. By counting the number of nuclei in various places and finding that it had not diminished, he could exclude desquamation of the superficial layers. Furthermore, two-thirds of the depression was due to thinning of the superficial corneal lamellæ. This condition, including Bowman's membrane, obtains also in my case, in which, however, the epithelial changes differ from those in my father's case. In my case a good part of the epithelial cells were gone and new cells had formed corresponding to the ridges.

A further essential difference between the two cases is that in my father's case the steep part of the border was at the limbus and in my case it was toward the center of the cornea. E. Fuchs, however, points out that in this respect the case he examined anatomically behaved just contrary to the ordinary cases. In my case the steep border at the central side corresponds to the condition usually observed in the clinic.

E. Fuchs believes the dimple to be due partly to evaporation, partly to a lesion of one or more of the short superficial corneal nerves. He excludes a disturbance of the circulation in the marginal loops at the limbus, because the dimple may be produced by injecting under the conjunctiva a solution of chloride of sodium without cocaine, after which the conjunctiva is congested. The dimples also occur in cases of episcleritis with great hyperemia of the conjunctiva.

Examination of the vascular network at the limbus with the slit-lamp does not reveal a change in the caliber of the vessels corresponding to the dimple nor any other anomaly. The dimples occur mostly if some liquid, as in edema after inflammation or muscular advancement, is present in the subconjunctival tissue. May it not be that this liquid compresses the vessels, reducing the blood supply of the superficial corneal layers? Furthermore,

might not a pinguecula, with its degenerated fibers advancing into the limbus, act in a similar way? In favor of a nervous cause is the fact that the dimples usually prefer the same site and that with certain patients they recur spontaneously.

E. Fuchs is correct in considering the influence of evaporation as insignificant, because in the cases of inflammation, operation, or injection, where the dimples occur, the eye is irritated and displays excessive lacrimation. Thus a nervous trouble is more probable.

No doubt, the nerves control to a certain extent the colloid condition of such living tissues as epithelial cells, corneal corpuscles, and corneal lamellæ. The so-called trophic disturbances are probably not so much due to an alteration of nutrition as to the cells losing their colloidal equilibrium, just as disturbance of internal secretions causes certain organs to grow or to atrophy. Nervous conditions lead often to severe disturbance of tissue metabolism, and in this respect I may quote the severe consequences after extirpation of the gasserian ganglion, hemiatrophy of the face, and so on. A nervous lesion would account for the rapid formation, the rapid disappearance, and the sharp delimitation.

The dimples are mostly without any clinical importance. Sometimes it may be difficult to distinguish an infiltrated dimple from a catarrhal infiltration, and sometimes its presence may help to account for a dark spot on the iris.

Similar dimples occur also in the conjunctiva, that is in the form of depressions remote from the limbus. They may bring the patient to the doctor because of a burning sensation in the eye. Such conjunctival dimples can be diagnosed only in spontaneous cases, not if present in cases of chemosis, suffusion, and so on, when neither the clinical aspect nor the discomfort of the patient would call attention to a dimple.

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DENDRITIC KERATITIS

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The literature with regard to the problematic etiology of this condition is briefly reviewed. Special consideration is devoted to the work of Birch-Hirschfeld, Duke-Elder, and others in treating dendritic keratitis with ultraviolet rays. Six personal cases are described in which this type of therapy was used. It is suggested that the reaction of this condition to ultraviolet radiotherapy may have some value in forming an opinion as to positive or negative influence of the malarial organism as the infecting agent.

For many years dendritic keratitis has been studied and recognized as more or less of a clinical entity. It has attracted attention because of its prolonged course and resistance to treatment. A typical description of the clinical findings is given in the American Encyclopedia of Ophthalmology, as follows: "A spreading superficial linear lesion, arborescent in appearance, the branches of which usually terminate in nodular swellings. The greyish borders of these furrows may be sloping or perpendicular. The adjacent areas are infiltrated in the form of discrete or confluent nebulous opacifications. The ulceration usually makes its appearance in the periphery of the cornea, sometimes crossing the entire width of the cornea, as in a case recently seen. These arborescent configurations usually stain readily with fluorescein, or in places do not stain at all. Ulceration, as a rule, does not invade Bowman's membrane. Photophobia, epiphora, ciliary injection, and pain are present in variable degrees. Anesthesia of the cornea is a frequent accompaniment. No immunity is granted by one attack, as is common in other forms of herpes. Trauma may initiate the original attack."

Classics on this subject were written by Kipp in 1890 and Wilder in 1893. Ellett, in 1889, described the condition as a malarial keratitis and expressed the opinion that it was not herpetic in character. He noted, however, that it had occurred as a sequel of one case of yellow fever and in a few other cases where no history of malaria could be obtained. It must be remembered, however, that in 1889 malaria was almost universal in the locality where Ellett practiced.

Charles wrote concerning this condition in 1904. He felt that there was a connection between it and herpetic disturbances and that there were two types, the papular and the fascicular. The first he attributed to malaria and the second to acute infectious disease. Both later assumed the typical dendritic appearance and he believed them to be terminal nerve lesions, and in support of this he presented four clinical observations: First, it had the form and location of a peripheral nerve lesion associated with lesions in the gasserian ganglion; second, anesthesia was present, due to neuroparalysis; third, elaborating somewhat on the first heading, arrangement of the lesion was similar to that of the nerve trunk with its fibrils, and even the center of the cornea was involved, marginal disturbances were present, showing its origin at the periphery; fourth, its chronicity, due to destruction of the vascular reflexes disturbing the blood supply to the lesion. Charles concluded that dendritic keratitis was either a degeneration of the nerve terminals from a toxin which caused an inflammation of the other tissues of the superficial cornea, or an active neuritis with trophic changes in a region in which the lymph channels were blocked and which was deprived of nerve supply. It is surprising how closely Charles' conclusions coincide with more modern ideas.

Turning now to papers of recent date, we find that much has been written on this subject in the years since 1920. In 1923 Kraupa-Runk discussed herpes of the cornea under four heads: first, keratitis fasciculosa; second, herpetic ulcer; third, dendritic keratitis; fourth, a herpetic form of disciform keratitis. The symptoms common to all are loss

or decrease of sensitiveness of the cornea, and liability to secondary infection, with extension to the uveal tract, glaucoma, and endothelial changes.

Numerous writers have described inoculation of the cornea from labial herpes, with the production of typical dendritic keratitis. Among these are A. Fuchs, Laude, Szily, and J. S. Friedenwald. The last named gives a detailed description. He states that twenty-four hours after inoculation minute vesicles are evident along the scratch and that the condition reaches its height in three to four days; and has also encountered profound general infection with marked nervous irritability, salivation, trismus, paralysis, and convulsions.

These lesions Doerr has demonstrated to be those of encephalitis. Indeed, such disturbances can be produced by intracranial inoculation from one rabbit to another with the same virus as that causing the keratitis. Doerr believes this virus to be practically identical with that of lethargic encephalitis. Lesions were found in the posterior ciliary nerves and the gasserian ganglion, and he was able to infect a rabbit with an emulsion from the gasserian ganglion of another rabbit whose cornea had been previously infected.

Levaditi believes that the path of the virus is from the cornea through the interior of the eye and along the optic nerve. Lipschütz, writing in 1921, had found in the cornea inclusion bodies similar to those seen in the nuclei in cases of lethargic encephalitis, particularly in the ganglion cells of inoculated animals. He believes these bodies to be neither hypertrophied nuclei nor degenerated nuclei, but similar to the inclusion bodies, such as chlamydozoa.

Grüter believes that there are modifications in the virulence of the infection, the stronger producing dendritic keratitis in man, the weaker various other conditions, including vesicular keratitis, superficial punctate keratitis, recurrent corneal erosions, disciform keratitis, and keratitis profunda.

De Benedetti, writing in 1923 in the Annali di Ottalmologia, reviewed the recent literature and summarized its conclusions as follows: "All forms of febrile herpes are due to specific infection which is transmissible in its typical vesicular form to some animals and is transmissible in series between the various animals and also in man. The herpetic infection leaves a notable degree of immunity. There is nothing certain concerning the morphology of the specific agent and doubt still exists whether the virus is filtrable. In behavior the virus shows a marked similarity to the virus of epidemic encephalitis and it probably belongs at least to the same group."

Numerous other reports might be given, but all authorities come to similar conclusions. It seems, therefore, that dendritic keratitis is an infectious process, the nature of the virus involved, however, not being clearly known. The recent work of Finnoff, however, is certainly very suggestive that malaria does play a part in certain of these cases. He noted that in at least one case of neurosyphilis treated by introduction of the plasmodium a typical dendritic keratitis was produced.

Therapy

The therapy of dendritic keratitis, like that of most resistant and rather misunderstood diseases, has run the gamut of the pharmacopeia. The old tradition of malarial etiology is reflected in our continued preference for quinine derivatives in its treatment. Quinine bisulphate is recommended by many writers. Optochin (ethylhydrocuprein) in my own hands and in those of some of my confrères has seemed rather satisfactory. Radiant heat apparently is of value. Atropin, holocain, strong solutions of mercurochrome, and many other drugs have been used with more or less success.

Focal infections have also played their part, and from my personal experience I feel that dental infection was responsible in several cases that cleared up rather promptly following removal of an infected tooth, whereas the eye

had resisted all forms of treatment previous to that time.

Recently, along with other corneal conditions, dendritic keratitis has been treated by ultraviolet light. Duke-Elder uses a modified Gullstrand slit-lamp, fitted with a mercury vapor lamp and provided with an optical system of quartz. Without a filter this lamp transmits its wave lengths from 2,350 to 5,790 a. u. Uviol glass permits the passage of rays of light from 2,900 up to 4,300 a. u. It is apparently with the former that Duke-Elder's work has been carried out, as no mention is made of a filter in describing his technique. With this instrument a beam of considerable intensity in any desired size can be used and its precise incidence upon the eye can be observed through the binocular microscope. The crystalline lens can be avoided by inclining the beam at a sufficient angle. Eserin may be used to contract the pupil and further to protect the lens.

Koeppe, 1919, and Birch-Hirschfeld, in 1922, introduced the carbon arc, which, however, emits a very large amount of heat, and Duke-Elder finds that any attempt to filter off these infrared rays necessarily reduces the intensity of the ultraviolet light. He criticizes the use of quartz rod directors as not being satisfactory in corneal lesions, as it is impossible to control the beam of light with sufficient accuracy. As to dosage, he finds that it varies with the individual, just as does the dosage with the large lamps used in general heliotherapy. He is of opinion that the best method is to test the erythema dose on the skin of the arm in each patient, and to commence radiating the cornea with a dose slightly less than this. The average is about three to three and a half minutes where the mercury vapor lamp is of the atmospheric pressure type and runs on 220 volts at two to three amperes. Duke-Elder also warns against increasing the initial dose by more than very slight amounts. The distance of the lamp from the cornea must be kept constant, and the angle of incidence must be taken into consideration. Using this apparatus, two cases of dendritic keratitis healed after two applications. Indeed, Duke-Elder's success with corneal lesions in general has been so good that he does not feel the use of generalized light treatment to be essential in these cases.

S. R. Gifford has used in his work the Birch-Hirschfeld radiation lamp, a carbon arc with a quartz lens system, and a filter of uviol glass or of a five per cent solution of copper suphate and permitting accurate focusing of the light on the cornea. The ultraviolet content of the light has been increased by the use of nickel, cobalt, aluminum, and iron cores in the carbons. Gifford reports that herpetic lesions have shown the most marked effects with such treatment, some healing after one or two applications. He is of opinion that this is due to their very superficial location. This series included fifteen cases of herpetic keratitis and dendritic ulcer, successfully treated. Many others have also reported good results from the use of the carbon arc lamp. Our results with the arc light in dendritic keratitis, using the nickel carbons, has been rather varying. One case has been definitely healed.

A spectrum absorption chart from the carbon arc transmitted through the various filtering media shows that either the five per cent copper suphate solution or the uviol glass filters out all rays of light below about 3,000 a. u., and, indeed, does not pass the entire amount of light below 3,500 a. u.; nor is this remedied by the use of various special cores in the carbons. But by a special dispersion apparatus light waves from 2,750 to 2,500 a. u. may be obtained from these arc lamps. As to the upper limits of these filters, copper sulphate permits the passage of the full volume of light up to 5,500, two-thirds up to 6,000, and a portion of it up to 7,000 a. u.; uviol glass up to 3,600 eliminating all of it at 4,050. According to the findings of Duke-Elder, the wave lengths containing the ultraviolet light most benefiting these conditions lie between 2,800 and 3,000 a. u.

As noted above, the light from the

unfiltered mercury vapor lamp sets an upper limit of 5,790 a. u., as against an upper limit of 7,000 a. u. from the carbon arc lamp with the five percent sulphate copper filter, and at the other end of the scale the former permits the passage of wave lengths of a limit of 2,350, as against those of 3,000 a. u. It would appear therefore, that the argument is reduced to a question as to the most beneficial wave lengths for ultraviolet ocular therapy. Duke-Elder, on the one hand, has found wave lengths about 2,900 a. u. to be most beneficial, while Koeppe, Birch-Hirschfeld, and many other observers have obtained good results with a lamp which with its filters obviously is incapable of passing light of wave lengths below 3,000 a. u. I am inclined to believe that the wave lengths below 3,000 a. u. are more active and destructive, but that those from 3,300 to 3,000 are also of value, although require longer exposure because of somewhat less marked activity.

Case histories

1. W. Z., first seen March 18, 1926, at which time refractive error was corrected. On the thirty-first a dendritic keratitis was made out. Cornea was anesthetic. More comfortable without dressing. Upper right molar dead, suspicious. Greatly cleared without removal of tooth. Treatment dionin, holocain, mercurochrome, atropin and cocaine in castor oil. July 25, 1926, again broken down. July twenty-seventh under care of Dr. Costen, who reports disturbance of sinuses, right sphenoid and posterior ethmoid. On August twelfth Dr. Costen operated. Condition was somewhat improved on the twenty-first, at which time patient disappeared and did not return until November twenty-seventh, when the ulcer had healed.

2. Geo. A., comes to the office from physician in Duluth. States that he had an attack of herpes zoster ophthalmicus. Center of cornea shows typical dendritic keratitis. Patient cleared up greatly without any special foci of infection being located. Practically complete recovery by March sixteenth. Treatment holocain, atropin, xeroform, etc.

3. Mrs. A. L., first came to office January 23, 1929. Had been under treatment at Washington University clinic. Light treatment was used on January 23, 26, and 30, ultraviolet light with copper sulphate filter. No improvement. On February first the ulcer was touched with pure carbolic acid. Healing slowly followed in the next four or five days.

4. F. J., injury to cornea May 23, 1927. Definite dendritic keratitis center of left cornea. Uviol light, probably three minutes. June first no better. Nasal and dental examination were advised. July twelfth one tooth removed. Abscess of the roots found. Patient discharged on the twenty-ninth. Some cloudiness of cornea. No ulceration. Dr. Gundelach found infected tonsils. No sinus trouble.

5. F. A., June 10, 1897, first diagnosis interstitial keratitis. Patient has had numerous recurrences and a definite history of malaria. First seen by me July 24, 1914. Left cornea showed a faint nebula. Repeated examinations of cornea showed considerable vascularity with ulceration. Present attack began October 25, 1928, with an ulcer, definitely dendritic in appearance, accompanied by some anesthesia of cornea. On the twenty-sixth uviol light was used for three minutes. Again used for three minutes on the twenty-eighth and thirtieth. Worse on the thirty-first On the first, light therapy again used. Became discouraged and discontinued uviol light treatment. On November tenth uviol light was again used for three minutes. On the twelfth, optochin two per cent was prescribed. On the fourteenth treatment with focal heat for ten minutes was prescribed night and morning. On the fifteenth thermophore was used for one minute at 142 degrees. In the meantime an iritis had developed, possibly following the first too energetic treatment with the uviol light. Quinine bisulphate three percent was applied to the lesion on the twenty-fourth. On the twenty-sixth uviol light was again used. On

the twenty-eighth copper sulphate solution five per cent was used for three minutes, on the twenty-ninth for five minutes. Quinine two grains was prescribed night and morning. Ulcer was taking on a fascicular appearance. On the sixth of December, carbolic acid was used. From that time on the ulcer began to improve. On February first there was a recurrence. Optochin was used and prescribed. The margins were touched with carbolic acid. This was repeated on the seventh. Optochin has been continued until the present time, and lesion is quiet though occasional activity appears about the ulceration.

6. L. S., first seen by me on April 18, 1929, at the Washington University dispensary. A marked neuropathic keratitis extended in a wavy line across the entire width of the cornea just below the horizontal meridian. This stained actively with fluorescein. The pupil was irregular, about 2 mm. in diameter, the iris showed a marked congestion. Atropin was instilled and prescribed in the form of atropin and cocaine oil, to be used every three hours. The following day the ultraviolet light filtered through uviol glass from a carbon arc with nickel core carbons was used for six minutes. The patient was sent home to continue the use of the atropin and cocaine oil and to report back to the office in four days. On April twenty-second, though the pupil still was markedly contracted, the patient stated that the eye was much more comfortable, and the ulcer stained over a smaller area. Uviol light was again used for five minutes. Three days later the lesion had entirely disappeared and the iritis was clearing rapidly.

It is interesting to note that case five, in which a reliable history of malaria was obtained, was unaffected by a prolonged course of treatments with the ultraviolet light, while case six, in which no such history could be obtained, was greatly improved from the very first treatment. Possibly the reaction to such therapy may prove of value in determining the positive or negative influence of the malarial plasmodium as the infecting agent in these cases.

Since going to press another case has similarly been treated with equally good results, and still another without benefit. No history of malaria was obtainable in either case.

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OPHTHALMOPLEGIC MIGRAINE

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A case presenting typical symptoms, without residual palsy between the attacks, is described. The clinical symptoms as reported in the literature of the subject are discussed. Some cases have been reported in which the diagnosis was probably unreliable. The author is disposed to accept the view that ordinary migraine and ophthalmoplegic migraine have a like pathologic basis, in the nature of a vasomotor change or a local edema. Read before the Chicago Ophthalmological Society, May, 1929.

The association of migraine with recurrent ocular palsies has now been described for sixty years or more, and forms a very interesting chapter in the history of neurologic ophthalmology. These cases of ophthalmoplegic migraine, while rare, have been reported in sufficient numbers for an intelligent summary of the condition to be made. A patient presenting a typical history and the usual objective findings forms the basis for this report.

Case report: A. H., a young married white man of twenty-eight years, a railroad track foreman, was referred to Dr. George W. Hall by Dr. F. A. Malmstone of Griffith, Indiana, and was first seen by Dr. Hall and the writer on April 3, 1929. His family history is negative except that his mother, aged fifty-six years, has for many years had periodic headaches which are now growing less severe and less frequent. Neither his father nor any of the brothers and sisters have been afflicted with migraine.

Our patient had his first headache, which was rather mild and indefinite, at the age of eighteen years after swallowing water while learning to swim. No paralytic features accompanied this headache, but one month later he had another more severe headache definitely unilateral, located immediately above his right eye, and accompanied by vomiting.

He was not sure whether visual symptoms initiated this headache, which lasted two or three days. As the headache disappeared at the end of this time he developed complete drooping of the right eyelid and inability to turn the right eye about. He had double vision upon raising the lid. This paralysis persisted one or two months, gradually disappearing entirely.

Since this attack ten years ago, he has had exactly similar attacks on an average of once a year, though once or twice he has gone two years without an attack, so that he estimates he has had eight attacks in the ten years. The attacks are all exactly alike: the headache is definitely localized over the right eye; it is somewhat relieved by pressure over the location of the pain; the headache is so severe that he goes to bed with it in a darkened room.

In the periods intervening between the ophthalmoplegic attacks he has occasional headaches without any ophthalmoplegia. He says there has never been any residual palsy between the attacks. The present attack began three days prior to his examination, and the headache had just disappeared the day before he was seen.

Upon examination he showed a complete ptosis of the right upper lid; upon raising the lid the right eye was seen to be externally rotated, the pupil dilated, and the patient unable to move the eye up, down, or medially. The power of abduction seemed intact, but the fourth nerve was paralyzed. The pupil responded neither to light nor in accommodation, and the vision in the right eye was reduced to counting fingers. There was a very slight weakness of the right side of the face on voluntary movement. The left eye was quite normal; both fundi were negative and the remainder of the neurological examination revealed nothing abnormal. The x-rays of the skull, the blood Wassermann, and the spinal fluid were all negative.

On May 15, 1929, he was seen again

(and was also examined by Doctor Frank E. Brawley). At this time he showed only a partial ptosis on the right side, the upper lid being about one-third of the way down, and he had regained moderate though not normal use of the third nerve, being able to raise and lower the eye to forty-five degrees from the horizontal and to bring the line of gaze of the right eye to the mid position but not medial to that. The pupil was, however, still dilated, and still fixed completely, reacting neither to light nor in accommodation. The perimetric field of the right eye showed moderate concentric contraction.

On May twenty-seventh the ptosis had practically disappeared, the pupil had begun to react slightly to light and in accommodation, and the extraocular movements had become normal except in looking to the extreme left. In a dark room the left pupil was larger than the right, but in a well lighted room it was smaller than the right.

This is a rather typical example of ophthalmoloplegic migraine. A search of the literature for similar cases brings one face to face with the larger but closely related question of other organic manifestations seen in migraine.

Transient focal signs and symptoms in association with or following migraine have now been described for a long time, and while infrequent, compared to migraine itself, are nevertheless well known. Indeed, when patients with migraine are questioned carefully, symptoms suggesting a focal cerebral process are not unusual. Among this group of manifestations suggesting a localizable process we may mention the widest variety of symptoms, and these we may for the sake of classification divide into sensory, motor, and psychic.

In the sensory group, probably the most common is a subjective hypesthesia, hyperesthesia, or paresthesia of part of the face or lips or of an arm or leg[17]. Reduction of sensibility in migraine is probably seen more frequently in the area of the fifth cranial nerve than in any other part of the body.[16, 21] Hemihypesthesias have been reported by Hunt[16] and others. Crude visual hallucinations are commonly seen in migraine, and formed visual hallucinations have been reported, although Gowers[13] denies this and says unformed hallucinations are characteristic of migraine, while the formed variety are typical of grand mal. Homonymous field defects are very common. Hunt[16] has reported a case of migraine with optic neuritis and with a paracentral scotoma which never completely disappeared. This might suggest another diagnosis, such as multiple sclerosis, but it is interesting to note that vision is usually poor in the affected eyes in these patients, and, while only a few perimetric field measurements have been made, scotomata may be more common than we know. Other sensory disturbances reported in the literature are very interesting, but more rare. Moersch[26] reported a migraine with an olfactory prodrome, a sort of uncinate-like symptom. In 1889 Vissering[40] reported a case with nerve deafness of a transient nature following migraine. Dizziness is seen so commonly in migraine that it needs no comment, although much of the dizziness of migrainous patients is due to visual and not to vestibular disturbances.

On the motor side, transient paralyses are common. We may briefly mention a few found upon a mere cursory examination of the literature. Transient hemiplegia and arm or leg monoplegia are reported, and J. Mitchell Clark[7] has reported a remarkable family in which for three generations migraine was associated with transient, recurrent hemiplegias, and in which one boy had migraine with bilateral hemiplegia of a temporary character. Transient facial palsy with migraine has been reported by Meige[23], Rossolimo[33], Bernhardt[3], and others; and such facial palsy, when on the right side, is sometimes accompanied by aphasia. Aphasia in migraine has been described by Oppenheim[29] and others, and the mental hebetude frequently seen in migrainous patients during the attack often suggests an aphasia. Oppenheim[29] mentions a case of paroxysmal cerebellar ataxia fol-

lowing migraine, with normal cerebellar function in the intervening periods.

But of all the motor accompaniments of migraine, we meet with transient recurrent oculomotor paralysis most frequently. Although Moebius[25] is usually given credit for the first description in 1884 of recurrent oculomotor paralysis, an Englishman, Saundby[34], in 1882, or two years prior to Moebius' article, beautifully described a typical case under the title "A case of megrim with paralysis of the third nerve". Moreover, Saundby stated it as his belief that the paralysis was due to the migrainous process, and this was eight years before Charcot[6] stated the same belief, although it is to Charcot that credit is usually given for this, the modern conception of the disease. Since these early writers, a voluminous literature has grown up about the subject, which it would be impossible to quote fully here.

As a rule the affection begins early in life, the majority of cases showing an onset between the ages of five and thirty years. Karplus[19], however, reports the case of a female infant of six months who vomited during a whole day, and then developed a complete ptosis, the paralysis clearing completely "in several days." In subsequent attacks, pain was added. On the other hand, Darquier, as quoted by J. B. Charcot[5], reported a case with onset at the age of sixty-three years. Such a diagnosis is, however, at least questionable, especially since the ultimate fate of the patient is not given. Some cases present ophthalmoplegia at the time of the first attack; for example our own case. Many and perhaps the majority, however, give a history of rather typical migraine without eye palsy for years prior to the first attack of ophthalmoplegia.

The individual attacks begin usually like any other migraine, with, for example, visual scotomata, generalized malaise, dizziness, depression both mental and physical, and then headache. It will be understood, however, that there are as many variations from this typical onset as one sees in simple migraine.

Almost invariably in ophthalmoplegic migraine the headache is truly a hemicrania, limited to one side, and often the extreme pain is so definitely localizable that it can be covered (in the words of our patient) with a quarter. The pain and vomiting are much more severe and protracted in ophthalmoplegic migraine than in simple migraine, cases being reported in which the headache lasts three days to one or two weeks. The headache and vomiting, if there be vomiting, cease suddenly, and it is usually, though not always, after cessation of the pain that the paralysis appears. Between the pain and the paralysis there is sometimes even an interval of from one to a few hours, during which the patient has no symptoms.

The paralysis of the eye muscles is the distinguishing feature of the condition. We may, therefore, examine the characteristics of this palsy more closely.

(1) It invariably occurs on the same side as that of the pain. So far as I can ascertain, this rule has been invariable in all the cases reported.

(2) Most usually a given patient always has his attacks on the same side. A few cases of "alternating ophthalmoplegic migraine" have been reported, but they are not common.[5, 42]

(3) The paralysis usually involves only the third cranial nerve, although many cases have been reported where the fourth or the sixth nerves were implicated. Some cases are on record where only the sixth was involved, and Luzenberger[42] reports a case with only a fourth nerve paralysis.

(4) The palsy may be of any degree from a slight weakness to complete paralysis.

(5) The paralysis sometimes lasts only a day or so, especially in the early attacks. More frequently, however, it persists for a matter of days, weeks, or even months before disappearing. In some patients the palsy, less frequent and persistent at first, gradually becomes more severe, frequent, and persistent with successive attacks, until at last it never quite clears up between the episodes. It is then a permanent

ophthalmoplegia with exacerbations at the times when the patient has attacks of migraine. Some patients have permanent palsies from the first attack, and the attempt has been made[28] to divide the cases into two groups, the completely remitting and the incompletely remitting, with the implication that the paralyses showing permanent residua probably have some nonmigrainous, organic lesions as their basis. This distinction is, as we shall see, unwarranted.

(6) Often attacks of simple migraine, unaccompanied by paralyses, intervene between the ophthalmoplegic episodes, as in our own case.

(7) The paralysis is usually both an internal and an external ophthalmoplegia, giving the typical picture—a ptotic lid, hiding an externally diverging eye with a dilated and more or less fixed pupil. But purely external ophthalmoplegia has been reported with normal pupillary responses[35], and, in the French literature, is recorded a case in which the pupil was paralyzed to light and in accommodation and all external muscles were normal.[4]

(8) Very interesting are the reports of two cases showing migraine not with paralyses, but with irritative spasm. Féré[11] reported a case of migraine with an eye which spasmodically turned up, down, or in, and a pupil which spasmodically dilated and contracted, together with a degree of accommodation which varied constantly back and forth from near to far. Meige[24] reported a case, somewhat similar, of migraine and spasm of the seventh nerve on the same side. In this case, however, there were no ocular palsies.

It should be remarked that not every case reported as ophthalmoplegic migraine is convincingly diagnosed correctly. Many cases so reported are atypical, with, say, only one attack, with no preceding migraine, without visual prodromes, without vomiting, and characterized by a permanent ophthalmoplegia and with no succeeding attacks. In view of the lack of an objective criterion for the diagnosis of any case of migraine and the extreme rarity of autopsies in these paralytic cases, such diagnoses must be looked upon askance. It must be admitted that the exact line between the migraines (of which there are many varieties) and nonmigrainous headaches is difficult to draw and at times a matter of individual opinion.

A difference of opinion exists as to the interpretation of these cases of ophthalmoplegic migraine. In 1884 Moebius[25] gave it as his opinion that the condition was due to an organic structural change which produced the paralysis, and that the headache was only symptomatic. Thus, he called the affection "recurrent oculomotor paralysis". He says: "In periodic oculomotor palsy, the lesion causes the palsy, and the migraine is symptomatic." In favor of such an opinion we have the fact that the only four autopsies upon such cases have revealed definite pathologic conditions. The first of these postmortem examinations was done in 1860 by Gubler[14], who found inflammatory thickening about the third nerve and elsewhere at the base of the brain. In 1885, Weiss[41] found a neurofibroma in the course of the third nerve. In 1887, Richter[31] found a fibrochondroma spreading apart the fibers of the third nerve, but leaving the nerve intact above and below the tumor. Finally, Karplus[19] in 1895 reported a case which showed a neurofibroma in the course of the third nerve. Gubler's case, however, came before ophthalmoplegic migraine was known, and the clinical details he gives convince one that the patient had a clinical meningitis, and leave us very much in doubt as to whether the diagnosis of ophthalmoplegic migraine should be accepted on his patient. The other cases as described were more or less bizarre, and showed clinically much more than a pure ophthalmoplegic migraine. For instance, in Karplus' case there was a diffuse encephalopathy with cystic areas, in addition to the tumor on the third nerve. One must be careful in interpreting these autopsied cases, because of the possibility that they represent a more extensive and qualitatively differ-

ent pathology from that responsible for uncomplicated ophthalmoplegic migraine.

Saundby[34] on the other hand, in 1882, and Charcot[6], in 1890, held that the same process essentially underlay simple and ophthalmoplegic migraine. Charcot thought that the paralysis seen in the latter condition was simply a result of possibly exaggerated degrees of what goes on in ordinary migraine. Hence, he thought these cases to be merely types of migraine, and therefore named them "migraine ophtalmoplégique" to indicate the migrainous nature of the condition. Oppenheim[29] follows Charcot, and most modern writers accept his theory. For this theory much can be said.

Simple migraine often passes gradually into ophthalmoplegic migraine; simple migraine of the same subjective characteristics often intervenes between the paralytic attacks. Joachim[18] reports a case of ophthalmoplegic migraine with persistent paralysis between attacks, which grew less severe as time went on, and finally showed complete remission of all paralysis between the episodes. Thus we see why a persistent paralysis can not be accepted as evidence that a nonmigrainous organic pathological condition is present. When we study the case histories of many of these patients in which an obvious migraine syndrome is for a long time repeatedly associated with a recurrent and remittent ocular palsy, without residual paralysis, and especially when we remember the other exceedingly numerous focal signs seen in simple migraine, it is hard to avoid taking the view of Charcot that this ophthalmoplegia is just another one of these focal signs. Meanwhile we recognize the fact that the diagnosis, to be made, must be based on clear-cut evidence, for many structural brain diseases can cause ocular paralysis and headache. If, however, we insist upon the characteristics as outlined above and the typical clinical course, there should be little doubt of the diagnosis.

We must, in looking for the pathogenesis of these ophthalmoplegic migraines, seek for a process that is transient, recurrent, and capable of leaving no permanent change, and yet capable also of producing structural damage after many recurrences.

The theory that vasomotor changes are responsible has much to be said in its favor.[21, 32] Vasomotor changes are transient. They usually leave, at least at first, no residual damage when seen in other parts of the body, and yet it is true that trophic or nutritive damage of a permanent sort may be done by vasomotor changes. In addition one may borrow a few characteristics of simple migraine in discussing ophthalmoplegic migraine. Vasomotor phenomena are extremely frequent in simple migraine, including the facial pallor during the paroxysm of pain and the flushing afterward. Also the drugs used commonly for the relief of the simple migraines are largely the antipyretic or vasodilator group. To explain these vasomotor changes, one need not assume the still debated fact that cerebral vessels have a vasomotor nerve supply, since Anrep and Starling[1] have shown a reciprocal relationship between the systemic and cerebral circulations, whereby generalized peripheral vascular spasm may increase the blood flow in the brain.

It has been suggested that local edema might explain ophthalmoplegic migraine—a sort of angioneurotic edema of parts of the brain.[3, 21] To support such an assumption one might point out that local edema may be transient, recurrent, and yet capable of doing, in the end, permanent damage especially to delicate neural structures. In addition we have the large number of observations tending to indicate that allergic phenomena play an important part in many cases of migraine.[8, 38] Foster Kennedy[20] has recently reported a case of serum sickness with urticaria, signs of meningeal irritation, transient aphasia, partial right hemiplegia, and homonymous hemianopsia, together with severe headache. And Osler[30], has described the case of a man who had migraine, transient hemiplegia, and angioneurotic edema. Such speculations

as to the nature of the process back of ophthalmoplegic migraine must, however, be recognized as pure speculations until we can have more definite data upon which to found them.

The question has been debated as to where the pathologic condition, whatever its nature may be, is located in these cases of ophthalmoplegic migraine. Contrary opinions have been held placing the lesion on the one hand in the nuclei of the ocular nerves[12] and on the other hand somewhere along the course of the nerves[32]. Consideration of a few facts will show us that it is in all probability an infranuclear rather than a nuclear lesion, although a nuclear location in certain cases is not impossible. In the first place, considering the fact that the third nerve receives part of its fibers from the nucleus of the same side, and part from that of the opposite side (according to Villiger[39] the fibers to the inferior rectus are entirely crossed, the fibers to the levator palpebræ and the superior rectus entirely uncrossed, and the fibers to the internal rectus and the inferior oblique both crossed and uncrossed) it is hard to understand how a lesion in the nucleus, no matter how small and selective, could give a complete, unilateral third nerve paralysis. Again, in many of these cases we have other findings such as a transient numbness in the area of the fifth nerve, or a sixth nerve paralysis, which could not be explained on the basis of a single central lesion, but are easily understood as being due to a single peripheral lesion back of the orbit. Finally, in Bernhardt's case of migraine with seventh nerve involvement[2], the paralysis was of the peripheral type. Some right facial palsies seen in migraine show aphasia, however, and either these must be supranuclear or we must assume more than one lesion. Multiplicity of areas of involvement in migraine is not difficult to understand, and, indeed, probably not unusual.

We are thus led to consider favorably the hypothesis that the immediate pathology underlying ophthalmoplegic migraine is vasomotor, or local cerebral edema (urticarial or angioneurotic in type), or both. By analogy, we may suspect that simple migraine likewise has a similar underlying nature, though of this we have no conclusive evidence.

Summary and conclusion

(1) A case of ophthalmoplegic migraine is presented, the history of the knowledge of the condition is briefly reviewed, and the usual clinical manifestations are described.

(2) Consideration of the transient and recurrent nature, and of the occasional tendency to leave permanent residual damage, suggests a vasomotor change or local edema as the pathologic basis for the condition.

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MODIFICATION OF TEAR SAC OPERATIONS

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The author's modification is designed to prevent hemorrhage during or after operation, and to promote primary healing. After removal of the sac and trephining, a folded strip of gauze is inserted in the trephined opening, by way of which it is afterward pulled on out through the nose with a pair of nasal forceps. A little of the gauze pack is withdrawn daily through the nose and cut off. The modification may be applied to every type of external dacryocystorhinostomy. From the eye department of the Jewish hospital in Budapest, Hungary.

A great many tear sac operations are known, ranging from the extirpation to the endonasal operations.

If we only consider the dacryocystorhinostomy operations, we may differentiate between an external type (Toti) and an internal or endonasal form (West-Polyak). Toti's technique has undergone many modifications, which may be classified into two main groups.

There are two modes of executing external dacryocystorhinostomy, namely:

1. Joining the mucous membrane of the nose to that of the sac, with or without stitches (Ohm, Kuhnt, Dupuy-Dutemps, Bourguet, Fazakas, and others).

2. Suggested by Blaskovics and others, extirpating the tear sac and perforating the bone, making a wide channel leading to the nose (Hötte, Kraupa, Cirincione, Poyales).

The latter mode of operating has been frequently applied here. Since January, 1928, fifty-six sac operations have been performed, of which forty-one were external dacryocystorhinostomy.

The technique of these operations is well known, and also it is a familiar fact that hemorrhage frequently occurs during or after operation.

If a pressure bandage or pack is applied it is not always effective, as blood may escape down the channel into the nasal cavity. On the other hand, if after removing the sac a cavity remains in which blood or wound serum can collect, it may be of importance in the process of healing.

Considering that a sac operation is not at all aseptic and that it is unavoidable that some of the sac contents get into the wound either because the sac itself tears or from cutting the canaliculi, it is comprehensible that complications are liable to occur, such as secondary healing, abscess development, phlegmon, and even erysipelas; the latter being frequently met with in extensive statistics (Böhm, Ohm—ten per cent).

To prevent or stop hemorrhage during or after operation, or in the interest of primary healing, the following procedures have been applied here:

Special technique: Before sewing the wound after removal of the sac and trephining, a neatly folded strip of selvaged gauze, 20 to 25 cm. long and 1 cm. wide, similar to the "Dührsen" tamponade used in obstetrics, is inserted in the trephined opening, by way of which it is afterwards pulled on out through the nose with a pair of nasal forceps. Then the skin incision is sutured.

This inserted gauze plays the rôle of a tampon or pack immediately after operation, and in the following days acts as a drain. Five to seven centimeters of gauze is drawn out through the nose each day, and by the time the skin wound has completely healed the tampon-drain will have been withdrawn.

Since January of last year, forty-one operations have been performed by this method, and all except one proved satisfactory. One patient redeveloped caries of the frontal process of the maxilla seven months after the operation. So far no postoperative complications have manifested themselves, although we are not overparticular in after treatment, patients being sent to their homes

three days after undergoing the operation, and from then on only being treated as out-patients.

Before concluding I should like to remark that the patients' noses were also thoroughly examined by x-ray, to ascertain whether any contraindication existed. In two cases the middle turbinate was found hypertrophied and was resected. In four cases the anterior ethmoid cells had to be cleaned out, consequent healing proving satisfactory. In five cases carious bone was scraped, with only one recurrence. Lastly, in seven cases fistula of the lacrimal sac was found. In every case extirpation was carried out, and, after insertion of the "tampon-drain" as described above, followed by suturing, primary healing set in.

After every operation healing occurred by primary union—even in the worst cases. This I believe is due to the "tampon drain", which causes all drainage to proceed in the normal direction of gravity, as in an artificially produced internal fistula.

The aforementioned operative modifications may be applied to every type of external dacryocystorhinostomy; first because application of the tampon-drain is in the direction of flow of tears and wound serum, secondly because the insertion is very simple and easily executed and the gradual removal is effected by drawing out through the nose, gradually reducing the amount of the pack.

In every case the nose was examined after the wound had completely healed, but without finding any complication.

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PRINCIPLES APPLIED IN USE OF CROSS CYLINDERS

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Astigmatism was understood by mathematicians before it was known to be so common and important. The cross cylinder finds the axis and strength of the correcting cylinder by instant reversal contrasts, repeated tests, and changes great enough to be certainly noticed. Read before the Colorado Congress of Ophthalmology and Otolaryngology, June 28 and 29, 1929.

Thomas Young[1] described the astigmatism in his own eye in 1794. He considered it normal although it amounted to over one diopter. In 1827 George Airy[2], mathematician and astronomer, worked out the astigmatism in his left eye, amounting to 3.50 D., and he had Fuller, an optician of Ipswich, make a glass to correct it.

In 1849 Stokes[3], a successor of Airy, as Lucasian professor of mathematics in Cambridge university, proposed the Stokes lens as a correction and a test for astigmatism. The Stokes lens consists of two cylindrical lenses of equal strength, one convex and one concave, mounted so that their axes can be inclined in different directions. When the axes are parallel they neutralize each other; while at right angles they give a cylindrical effect, double that of either lens alone, convex in one meridian, and equally concave in the other. This was the first cross cylinder testing lens.

In 1885 Dennett[4] suggested a Stokes lens as a practical test for astigmatism. Its theoretic fitness for the purpose seemed perfect, but very few have used it in practical diagnosis. Later it was put on the market in a shape supposed to be very convenient; but this never was regularly used by those who do much measuring of ocular refraction.

In 1886 the writer became interested in the equivalence of a spherocylindrical to any possible combination of cylindrical lenses, and worked out a general mathematical formula proving such equivalence[5]. This problem had already claimed attention and others had worked out demonstrations for it. In the discussion of the writer's paper, Gustavus Hays[6] of Boston presented a demonstration that had been worked

out for him sixteen years before, by Professor Oliver, a mathematician. At the suggestion of Donders, Hoorweg[7] had published a solution of the problem in 1873. In 1900, Charles F. Prentice[8] published tables of such equivalents.

After finding that each combination of cylindric effects could be secured by a spheric and one cylindric lens, the writer began to use the spherocylindric lens, as Stokes had suggested the cross cylinder should be used, for the measurement of astigmatism. Such a lens, placed before the eye, separates cylindric effects from spheric refraction, and allows the measurement of each before the other has been fully worked out. The first principle applied in the use of the cross cylinder is for the separation of spheric from cylindric refraction; as we separate the two eyes when we wish to test their vision by covering one while we test the other.

Spheric lenses have been used to test spheric refraction since spectacles were invented; and, making no change in cylindric effect, astigmatism can be ignored in their use. But the convex and concave cylinders, introduced in the trial case at the suggestion of Donders, do change the plus or minus spheric effect, and confuse it with the changes sought by change of cylinder. The cross cylinder, whatever way it may be turned, leaves the general plus and minus before the pupil exactly the same. The change of vision it produces is entirely by change in the cylinder.

There are two things to be ascertained about every cylinder used for the correction of astigmatism, the strength of the lens and the direction of its axis. The cross cylinder analyzes the problem. With it we can test the changes, either in the direction of the axis, uninfluenced by the strength; or in the strength, without changing the direction of the axis.

The analysis of a problem for investigation is one of the most widely applied methods in the study of science. It is used to find the unknown quantity of an algebraic equation, to detect the break in an electric circuit, to discover the chemical composition of substances, and in a thousand other scientific processes.

Direction of axis

Whatever the method of measuring regular astigmatism, it is well to begin by ascertaining the direction of its principal meridians—the direction of vessels seen clearly with the opthalmoscope, the band in skiascopy, the direction of lines seen best or worst in the fan or clock-dial test. Perfect determination of axis by means of the cross cylinder may require a close approximation to the amount of astigmatism; but it is best obtained by using before the eye a cylinder slightly stronger than the one actually needed for correction.

Curiously the value of the cross cylinder in finding the meridians of astigmatism came to be understood only after it had been used for fifteen years as the principal means of measuring the difference in amount of refraction between the two meridians. Most of the allusions to the diagnostic use of the cross cylinder mention it only for finding the strength of the required correcting cylinder. This use has been admirably explained by Maddox[10] in his "Golden rules of refraction", and is given by Duke-Elder[11] in his recent "Practice of refraction".

Effects of combined cylinders

The use of the cross cylinder in determining the meridians of astigmatism may best be understood by a simple experiment. Take two cylinders and place them in the two grooves of a trial frame —any two will do, but — 2.00 and + 2.00 serve very well; and with them place a + 3.00 spherical to focus a light on a card or on a piece of paper used as a screen. The — 2.00 cylinder can represent hyperopic astigmatism and the + 2.00 cylinder the correcting glass. When these are turned with their axes parallel they neutralize each other—full correction. When they are placed with their axes at right angles they cause an astigmatism of 4.00 D. in the pencil of rays passing through them. Placed at meridians oblique with each other, they cause other amounts of as-

tigmatism, the focal lines of which can be demonstrated by holding the card at the appropriate distances from the lenses. These different amounts of astigmatism vary from 0 to 4.00 D., according to the turning of the cylinders; and the directions of their meridians can be made to pass through the whole range of 180 degrees.

After becoming familiar with this experiment, take a cross cylinder and hold it with its meridians oblique to those of the focal lines. Each turning of the cylinder will change the direction of the focal lines and change their length. When the cross cylinder handle is just in the direction of a focal line (the meridian being forty-five degrees from it) the turning of the cylinder throws the focal line equally in either direction, and shortens it one way just as much as the other. This is a demonstration of what happens when the cross cylinder is used before an astigmatic eye to determine whether the correcting cylinder in the trial frame is in the right direction.

This experiment may be supplemented by use of a cross cylinder in testing one's own eyes either for the natural astigmatism or for that produced by placing cylinders before the eye of various strength and at various meridians. Some practical acquaintance with what the patient has to observe when being tested is very valuable for the ophthalmologist, who has to work through the patient's eyes when testing astigmatism.

Reversing the effect for contrast

A principle of accurate scientific testing which is applied with the cross cylinder is the reversal of effect when the cylinder is turned from one direction to the other. The clock dial or sunrise cards, or other tests with radiating lines, show the blurring of lines at right angles to the lines most accurately focussed. The placing of a cylinder in the trial frame with its axis nearly in the right meridian, and then turning it first one way and then the opposite to see which is better and which worse, is a way of applying this principle. But the cross cylinder test is a better way. Turning the cylinder in the trial frame causes a very slight, often imperceptible change as the axis begins to depart from its best position; and usually it begins to make a marked change only after the axis has been considerably rotated.

Turning the cross cylinder, by rotating its handle, in effect carries the axis from extreme rotation in one direction to extreme rotation in the opposite direction; and emphasizes as much as possible which is better and in which direction the correcting cylinder ought to be turned. The experiment with cylinders in the trial frames can be used to illustrate this, by first turning the focal lines gradually by the old method, and then producing the instant change by rotating the cross cylinder. The slow movement of a mountain, a hundred feet in centuries, is not perceived by any one. Sudden shaking of the earth, if only a fraction of an inch, in an earthquake, is noticed by everybody. The cross cylinder is used as a supplementary lens, and the sudden changes made by supplementary lenses are of the greatest importance in accurate testing of ocular refraction.

Repeated tests

Accurate scientific measurements are attained by repetition. A base line for the coast survey is obtained by fixing two points and measuring the distance between them with most accurate instruments for months or years—a hundred or a thousand times. The principle of the repeated tests must be applied in all important ocular measurements. Each test with a cross cylinder may be made in a few seconds. It may be repeated many times at a single sitting.

The cross cylinder facilitates the repeated measurements that bring out differences of result shown on different days or under varied conditions; and it thus makes the determination of astigmatism one of the most exact and satisfactory of ocular tests.

Any complete examination of the eye must include repetitions of measurement of spheric refraction, of direction of meridians, and of amount of astigma-

tism. These must be repeated one after the other, until all are measured with accuracy and certainty; sometimes under different conditions of lighting and of previous use or rest of the eyes. The need for such repeated tests has probably had more to do with the advantages of cycloplegia than have the mysterious and sometimes mythical variations of accommodation.

Adequate changes of impression

The cross cylinder furnishes a simple, convenient, practical means of making the changes in focus sufficient to be noticed by the patient, whether the patient's vision be above standard or very poor. The strength of lens must be adapted to this, beginning with the stronger cross cylinders and reducing the strength until the limit of accuracy has been attained. It is surprising how much time we waste in making such slight changes in the lines and letters of test cards that the patient can not be sure which way is better, and leaves the examiner as much confused and mystified as himself. If by previous tests the eye has shown standard vision, it is well to begin with a + 0.50 — 0.50 cross cylinder and ask which way makes vision worse. If the eye has only 0.25 D. of astigmatism, the patient will generally indicate which way does make it worse, even when vision equals only 20/30. The axis may thus be located within ten degrees. After finding that the eye is astigmatic, and learning about the direction of its meridians, the + 0.25 — 0.25 cross cylinder may be used to determine the correction more accurately.

When the vision is very poor, say 10/200, from corneal scars, vitreous opacities, or partial cataract, it is always worth while to try whether very strong cylinders say + 5.00 and — 5.00, with their axes held at right angles to each other, do or do not make the vision notably worse in one direction than the other. This may greatly help the diagnosis of corneal distortion, as by conical cornea. In this way may be obtained a helpful hint that astigmatism is a factor in poor vision, instead of leaving the patient hopelessly waiting for a cataract to ripen or a corneal scar to clear up, in an eye where the ophthalmoscope or the shadow test, or even the ophthalmometer, can give us no help at all. This resource ought to be available to every patient who brings his defective eye to the ophthalmologist. The principle of making a change great enough for the patient to notice with certainty must be kept in mind in all refraction work.

Contrast by reversal of effect, by holding before the eye alternate convex and concave spheric lenses, or by turning the cross cylinder, is a principle that the determination of refraction has in common with many other methods of scientific measurement.

Although the cross cylinder may be used with good result in any state of adjustment of the eye, general relaxation of accommodation is most favorable to determination of the lenses that will correct the refraction and will allow use of the eyes with the least effort. The fogging effect of an excess of convex in the lenses placed in the trial frame furnishes a favorable condition for use of the cross cylinder. Even when a cycloplegic has been used, it is important to ascertain the strongest convex or the weakest concave that will be accepted by any part of the dilated pupil. With the pupil undilated, the correction of astigmatism may bring out an unexpected acceptance of convex lenses. In all correction of distance refraction, the greatest possible relief from effort is to be aimed at, equally with attainment of the highest acuity of vision.

The method of using the cross cylinder is so much better learned by demonstrations, or by trial of it in the subjective testing of one's own eyes, that little allusion to it is made in this paper. But any general discussion of the subject may well include questions of technique; and the purpose of the paper is to promote a better understanding and more general routine use of this means of testing ocular refraction.

217 Imperial building.

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HEMANGIOMA OF THE ORBIT

Report of a case with operation

DAVID SHAPIRO, M.D.

PASSAIC, NEW JERSEY

The patient was a girl of twelve years. The eyeball had protruded at birth and the orbit was greatly enlarged. The vision of the affected eye was 20/60. The tumor was attached to the bone above the optic foramen. After removal of the tumor, vision was retained as before operation, and the ocular movements became relatively normal.

The following case of orbital tumor is unique as to onset, growth, character of tumor, and results of operation. The only other case somewhat similar to mine in the American literature was reported by Bull in 1918.

The patient, D.M., was a twelve-year-old girl who was admitted to the Barnert Memorial hospital in May, 1929, because of marked proptosis of the right eye. According to the history this eye had protruded since birth and the exopthalmos had slowly but constantly increased, until six months before admission, when its development was much accelerated.

Examination on admission showed a fairly well nourished girl whose face was badly disfigured by the ocular deformity. The child's mentality appeared slightly retarded, although this may have been due somewhat to the consciousness of her disfigurement.

General physical examination revealed no abnormality apart from the right eye. The heart and lungs were normal and no general adenopathy was demonstrable.

Ophthalmological examination showed a normal left eye with a vision of 20/20. The right eye (see illustration) protruded from the orbit and was displaced downward, inward, and forward. The lower lid covered the lower inner third of the pupil. The upper lid left exposed the upper two-thirds of the pupil and the conjunctiva of the upper

Fig. 1 (Shapiro). Hemangioma of the orbit; condition before operation.

and outer part of the bulb. The eye could be covered by the lids when an effort was made to close it, but the patient preferred to hold her hand over the eye to hide it from view. Ordinarily it appeared as though the eye were out of the orbit, and held in place only by the lower lid. There was an eversion of tissue in the upper fornix above the

eye. This tissue was soft, but not fluctuating or pulsating. The lacrimal gland protruded from the orbit, hanging under the upper lid at the superior external angle.

An effort to move the eye outward succeeded only in bringing the pupil almost to the mid line. Other ocular movements were normal. The pupils reacted normally to light and accommodation. The vision of the right eye was 20/60.

Ophthalmoscopy was normal except for slight engorgement of the retinal veins in the right eye. X-ray examination revealed uniform enlargement of the right orbit.

An operation was performed May 23, 1929. A horizontal semicircular incision was made in the conjunctiva, extending from the inner canthus upward into the fornix and down to the level of the outer canthus. The conjunctiva was dissected, and a shiny purplish mass appeared, which extended superficially approximately as far as the original conjunctival incision. The upper lid and eyeball were retracted upward and downward respectively, permitting the mass to be dissected with curved scissors and forceps. Only about two-thirds of the mass could be dissected in this way as the lower third was attached fan-shaped to the bone of the orbit immediately above the rim of the optic foramen, and could not be visualized because the posterior surface of the eyeball was in the way. Because of the large size of the orbit, however, I was able at this stage to insert my fifth finger behind the tumor and gently separate it from its wide and strong bony attachment. By inserting the same finger between the tumor and the eyeball in front, the stretched optic nerve could be felt. The tumor was removed en masse, the eyeball dropped back into position, and the conjunctiva sutured.

Fig. 2 (Shapiro). Hemangioma of the orbit; seven weeks after operation.

One week after the operation, the proptosis and downward displacement had completely disappeared. The inward displacement was unchanged, due probably to weakening of the external rectus during the operation by injuring it or by loosening it from its attachment. The upper lid was almost closed because of weakening of the levator.

Six weeks after operation the eye could be opened very well. The levator had almost completely recovered. The external rectus had also improved greatly, as the pupil could be carried out beyond the mid line.

Vision remained unchanged. I feel that in this case a successful operation was rendered possible by the fact that the tumor was congenital. This caused the frame of the orbit and the optic nerve to accommodate themselves slowly to the abnormal pressure. The enlarged orbit and elongated optic nerve permitted the operation.

The report of the pathologist, Dr. H. Wassing, follows:

"The specimen is a disc-shaped tumor, one and a half inches in diameter. At its thickest it measures three-eighths of an inch. The weight of the specimen is five and three-fourths grams. The tumor appears encapsulated by a thin membrane and surrounded by some fatty fibrous tissue. The outline of the specimen is irregular and somewhat ragged. The consistency is moderately firm, the color brownish-red.

"On section it shows a smooth cut surface. Most of the substance is of brownish color, with grayish-white specks interspersed. In some places thin-walled cavities, filled with coagulated blood, can be observed. In the grayish areas no definite structure can be recognized.

"Microsopic examination: Sections through the entire width of the specimen include both hemorrhagic and whitish spots. The latter areas reveal

outlines of capillaries in which the endothelial lining is still present. These are, however, distended and the lumen is replaced by old connective tissue elements. Quite frequently in such obliterated blood vessels small round cell infiltrations may be noted. The hemorrhagic areas are composed mainly of thin-walled capillaries, lined by flat endothelial cells: their lumina are distended and filled with red blood cells. Some of these capillaries reach the diameter of 0.75 mm. Many of the capillaries are surrounded by a sheath of fibrous connective tissue cells, reaching a depth of seven or eight layers, arranged in a perithelial fashion. However, nowhere can any proliferation of endothelial elements be noted, and there is no invasion of the surrounding fatty fibrous tissue by the tumor.

"Diagnosis: benign hemangioma (partly hyalinized and fibrotic)".

104 Passaic avenue.

NOTES, CASES, INSTRUMENTS

OPTIC NEURITIS AND VITAMIN B

THOMAS HALL SHASTID, M.D., F.A.C.S.
DULUTH, MINNESOTA

All eye physicians from time to time have optic neuritides of apparently undiscoverable origin. The Wassermann in these is negative, no pus can be discovered anywhere, and in fact the general system as well as the anamnesis is absolutely negative. The patients simply have optic neuritis, and that appears to be the whole story.

In two such cases, recently, I used vitamin B in large doses. In each instance the patient made a prompt and complete recovery. In one of the cases I employed a well known wheat germ extract (vitavose); in the other, yeast. I have often, in optic nerve affections, found much value in yeast. In the latter of these two recent cases, however, I used nothing but yeast, and the result was most excellent.

Or was there really any "result"? Was there merely coincidence? I don't know. But the sequel, if not the result, was so impressive that I now ask others to give vitamin B a trial, in order that the truth may be ascertained.

We all know that in some way vitamin B does profoundly affect nerve tissue.

629 East First street.

A SUGGESTION IN CROSS CYLINDER TECHNIQUE*

RALPH W. DANIELSON, M.D.
DENVER

The papers by Jackson, Schneideman and Crisp on the use of the Jackson cross cylinder in refraction are very interesting and instructive. Those who use the cross cylinder are enthusiastic about the facility with which an accurate determination of the amount and the axis of the astigmatism may be obtained. One is, however, frequently confronted with a patient who insists on repeating, "I see better without it". This is the more apt to occur when one approaches the exact correction.

It is, of course, understood that one should preface every refraction with the cross cylinder by saying something similar to this: "Now I know that at times you will see better without this than with it, but all I want you to notice is which side of the glass is the better of the two". But it is psychological for the patient, especially the clinic patient, to persist in believing that the examiner is trying to make every change a little better, and his confidence may waver just a trifle when his vision is made worse.

To impress the patient that there is

* From the department of ophthalmology, University of Colorado school of medicine.

no mistake, one may proceed from a different viewpoint. To this end in our clinic Dr. Donald H. O'Rourke uses the question, "Which is the worse of the two sides?" while Dr. Phillips Thygeson asks, "Which side blurs it the more?"

To assist the patient in ignoring the image experienced before placing the cross cylinder there are several methods that may be employed. Usually all that is necessary is to pause a moment before asking the question after the cross cylinder is in place. Or one may hold the cross cylinder constantly in front of the eye while changing the axis or the amount of the cylinder. But by far the most reliable method in obstinate cases, in my experience, is to have the patient close both eyes while one is making a change, and to place the cross cylinder before the eye while it is still shut. There are then only two ways between which to make a choice, and this choice is facilitated by one of the fundamental advantages of the cross cylinder, that of instantaneous contrast. The rest which eyes and brain obtain from closing the eyes for a short while is of itself a valuable asset, many patients making a quick decision after whereas they vacillated before closure.

The essential value of the maneuver here suggested lies in reducing the possible choices from three to two by the simple procedure of having the patient close both eyes while the examiner changes the lenses and places the cross cylinder in front of the eye which is being tested. Obviously one will need to utilize this suggestion more frequently with clinic patients and children, and special questions are often called for in individual cases.

4200 East Ninth avenue..

BAD REFRACTION VERSUS BAD PSYCHOLOGY

THOMAS HALL SHASTID, M.D., F.A.C.S.
DULUTH, MINNESOTA

A man aged forty-four years had had severe headache almost constantly for several years. When I had corrected his optical errors and phorias, he was for a time greatly improved. Then the headaches began again.

After each periodic, semiannual check-up his headaches would totally disappear. But soon they would return without, so far as immediate rechecking could demonstrate, any mistake having been made in his correction.

Once we put him through the entire clinic to see what else than the eyes could be at fault. The result was altogether negative.

The situation was, in fact, mysterious in the extreme—until one day when the patient's wife came to see about her own eyes. I then inquired concerning her husband, and she replied that she herself had cured his headaches. Asked how, she answered: "Well, you see, hubby at night is always very tired, or else lazy. So, after dinner, he used to sit in the living room and go to reading with his distance glasses, his near glasses being upstairs, therefore too far away for him to go and get them. He always expected to read 'just for two or three minutes'. But always, of course, he would stick to the job for two or three hours. Next day he would have a frightful headache.

"I at last decided to take a hand in the matter. Whenever he sat down after dinner to read 'just for one or two minutes', I would rise, traipse upstairs to where he had left his reading glasses, traipse down with them, and make him put them on and use them.

"The result was—no more headaches".

At this man's next periodic check-up, I prescribed for him, willy nilly, a pair of bifocal glasses. Result: no more headaches, also no more unnecessary "traipsing" upstairs and down again for his wife.

It seemed that after each periodic check-up the man would be sufficiently interested in his eyes for just a few days to get and use the near glasses for night reading. After a time, however, becoming less interested in his own case, he would fall into the habit of reading with the distance lenses—at

least of nights when he was tired. That was, of course, just the time when he needed the near lenses most. On arriving home, each evening, he would, apparently, first of all go upstairs and, having used his near glasses there for some purpose, perhaps shaving, lay them on a table, put on his distance glasses, and, after a time, having donned coat and vest, go downstairs without his near glasses.

The problem, on the surface, seemed to be one of optics, but it was really one of psychology.

In a similar case a man already had bifocals. Still, from time to time, he would suffer from severe headache. He was a short man whose occupation necessitated frequent conversations with other men on the public streets. That, of course, meant frequent near gazing on the human countenance and facial expression at a distance of perhaps three feet, often less. This gazing, inasmuch as the patient was a short man while his interlocutors were frequently tall, generally had to be done through the upper segments of his glasses. I therefore prescribed for him a pair of grabs, +1.25 D., to pop over his bifocals whenever he was speaking with anyone on the street. Result: no more headaches.

At one meter the demand is for one diopter of accommodation. Closer still, it is of course more. The patient in question, being an advanced presbyope, had only been able, without his grabs, to squeeze and squeeze his much stiffened crystalline lenses ineffectually and with consequent cephalalgia.

A woman of twenty-five years, for whom I had prescribed +0.50 D., found her glasses excellent for distance, but productive of much blurry vision whenever she looked down—for example, in reading. Examination of her glasses, together with questioning, showed that the temples of the glasses were just a trifle loose and that the patient in consequence was from time to time putting her fingers up against the lower parts of the lenses so as to push the glasses higher. For that reason the lower parts of the lenses were almost always blurred. She was a highly educated woman, but had not been able to make the necessary simple observation for herself.

Tightening the temples effected an immediate cure.

The same procedure often helps patients who find bifocals just right for distance but blurry (therefore apparently too strong) for near.

629 East First street.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

June 11, 1929

Dr. A. C. Lewis presiding

Amblyopia of obscure origin, ? traumatic.

Dr. P. M. Lewis reported the case of B. W., white male aged twenty-seven years, who had been first seen on March 8, 1929, with the complaint of blindness of the left eye. Six months previously he had received a violent blow just above the left eye which rendered him unconscious for several hours. Following this he noticed that he could see very little with this eye. He was positive that the vision of the left eye was good before the accident, as his eyes had been tested several times. The condition remained practically unchanged.

The right eye was normal except for moderate myopic astigmatism, the correction of which gave 20/20 vision. The left eye was normal in appearance and in its movements. The pupil reacted only very sluggishly to light directly, but well consensually. Vision was moving objects only. Peripheral field for form was fairly good, but there was a large irregularly shaped, absolute central scotoma. The right field was normal. Ophthalmoscopic examination, repeated on three different dates, showed no pathology. Various malingering tests were tried with negative results. Retinoscopy of the eye showed that he should take a plus 0.50 sphere. The nasal sinuses were normal and general physical examination negative.

Discussion. Dr. Stanford said fracture of the orbit must be thought of, and he suggested an x-ray of the optic canal.

Dr. P. M. Lewis thought the disc ought to show atrophy after that length of time if the condition were due to a fracture.

Secondary glaucoma

Dr. James B. Stanford presented Mr. D.C.L., who had suffered a contused wound of the right eye on May 25, 1929. On that date a piece of half-inch-round iron flew out of a vise and struck the right eye. He was seen a few hours later when he was found to have an abrasion of the center of the cornea, a small metallic foreign body in the cornea, and some blood in the anterior chamber. He was suffering considerably and was nauseated. The foreign body was removed, atropin was instilled, and he was put to bed. Two days later a fresh hemorrhage appeared in the anterior chamber, and the next day much more blood was seen, with tension of plus two to the fingers. The patient was put on eserin, but the tension remained up and the blood did not become absorbed. Pain was so severe as to necessitate opiates. On June seventh, a small keratome incision was made and coagulated blood was removed by irrigation. Since the operation the patient had been comfortable and the anterior chamber had been only slightly cloudy, but the pupil had remained dilated and the tension was 42 mm. with the Gradle-Schiøtz tonometer. The vision was limited to perception of light.

Mercuric iodide injury of the conjunctiva

Dr. R. O. Rychener reported a case of burn of the conjunctiva following local applications of calomel and the internal administration of potassium iodide. An eight-year-old female child had been seen many times with phlyctenular keratoconjunctivitis which yielded to the local administration of powdered calomel. During the course

of one of these exacerbations she was seen also by an internist and was given internal medication. Within twenty-four hours she presented a lesion of the conjunctiva of both eyes which was gray and sloughing in appearance, and injury due to mercuric iodide was at once suspected. A telephone conversation sustained the suspicion, as potassium iodide had been one of the constituents of the preparation administered internally. Both this and the calomel were omitted for three days. The conjunctiva healed and later calomel alone was administered, without further incident.

R. O. RYCHENER,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

June 17, 1929

DR. HERSCHEL EZELL presiding

Dionin in a case of acute iritis

DR. W. W. WILKERSON, JR., had been called to see Mrs. J. W. A., white female aged forty-five years, found her complaining of pain in the right eye, and on examination diagnosed the condition as acute iritis. There was nothing of any importance in the history of the case. The patient was referred to and examined by various men in the hope of ascertaining the focus of infection causing this condition, but none was found.

The pupil of the right eye was dilated with one percent solution of atropin sulphate. Iris pigment was then found on the capsule of the lens. The tension with a Schiøtz' tonometer was 18 mm. After using atropin for three days the patient began to complain of severe pain in the right eye, and the tension was found to be 45 mm. He discontinued the atropin and two days later the tension again was 18 mm. Once more he dilated the pupil with atropin and again the tension went to 45 mm. A consultant was called in and suggested continuing the use of atropin and also using an eight percent solution of dionin, two drops in the affected eye three times a day. Twenty-four hours after the dionin was begun the tension dropped to 18 mm. and it did not increase afterward. The patient had received other ordinary treatment for iritis such as hot compresses, salicylates, iodides, etc.

Discussion. DR. GUY MANESS had been using eight percent dionin as a routine in such cases. It seemed to work well.

DR. FRED HASTY said there was danger of getting conjunctivitis from the eight percent solution.

DR. HERSCHEL EZELL asked if a weaker solution would not do.

DR. W. W. WILKERSON said he had tried it and found that it would not. He had been using a two percent solution and it did not work, but the eight percent gave prompt relief.

DR. M. M. CULLOM asked if there was much edema following the dionin.

DR. W. W. WILKERSON replied that there was none.

W. W. WILKERSON,
Secretary.

SAINT LOUIS OPHTHALMIC SOCIETY

April 26, 1929

DR. WILLIAM H. LUEDDE, president

Dendritic keratitis

DR. M. H. POST gave a short history of the early ideas with regard to dendritic keratitis, showing the stress put upon its association with malaria. Following that, the more recent experimental work was reviewed, proving its relation to herpes and its similarity to lethargic encephalitis. The therapeutics of the condition were next discussed, showing the wide variety of drugs that have been recommended for these lesions.

Finally, the use of ultraviolet light therapy was considered at some length. The conclusion was reached that definite benefit was possible, either with the mercury vapor lamp, or by longer exposures to the carbon arc. Five cases were reported, one case recovering rapidly with no treatment other than atropin and ultraviolet light.

Discussion. Dr. Joseph Charles said that since he had first advanced his hypothesis in Alt's American Journal of Ophthalmology, April, 1904, he had noticed that most writers spoke of dendritic keratitis as a vesicular lesion. At that time he had described two forms of dendritic keratitis. The herpetic had been studied a great deal until the virus had been almost discovered, and this type had taken up most of the literature on the subject. In 1904 a case came to him in which there were no vesicles whatever but connected gray lines. He then made the statement that there were two forms; the papular or infiltrative and the vesicular. Since that time he had noticed a number of cases which were infiltrative and not vesicular.

An infiltrative case seen in consultation with Dr. W. A. Shoemaker was reported. The case had been very aggravating and nothing seemed to help until a sinus was found to be causing the trouble. After treatment of the sinus the ulcer healed almost miraculously.

Two more cases of the infiltrative type, due to sinus disease, were mentioned, and the suggestion was made that when treating the infiltrative form focal infection as well as other poisons should be sought.

Dr. M. H. Post said that he felt that the corneal lesion was a secondary lesion but that the cornea could be definitely infected by implantation of the virus from lesions of a similar nature, or from the gasserian ganglion in cases having such lesions. Apparently the virus traveled from the cornea to the ganglion and vice versa. The anatomic lesions in the ganglion and the symptom complex were similar to those of lethargic encephalitis.

He was still uncertain with regard to the value of ultraviolet light, though his last case was most satisfactory. In fact, the lesion cleared completely after two applications of six minutes each, five days apart.

As to the use of cocain in corneal lesions, he felt that it was not contraindicated, providing it was used in the form of an alkali in an oil, such as castor oil or liquid albolene. Using it in that way he had obtained great relief from pain and had seen no injury to the cornea.

Further visual results with telescopic glasses

Dr. Leo L. Mayer reviewed thirty-five patients on whom telescopic lenses had been tried, and specific results were given. This was the second series of cases reported by Dr. Mayer, the first series having appeared in the American Journal of Ophthalmology, April, 1927.

Discussion. Dr. C. W. Tooker suggested that the tabulation of these cases should include near vision with ordinary lenses in comparison with telescopic lenses.

Dr. Charles said that he had reported to the Society on an old lady with cataract whose vision was not greatly improved with lenses. Another case was that of a young man with alcoholic amblyopia. His vision was 6/150 right or left. He gave him telescopic lenses, and as a result he could read stock reports and in addition he could enjoy the movies. His vision with the special lenses was O.D. 19/240, O.S. 19/96.

Dr. Hardy inquired about conceivably progressive conditions and how to handle them.

Dr. M. H. Post asked about the cost of changing the reading correction of these glasses.

Dr. Alvis reported a case of progressive degeneration of the choroid. At the first visit he had given the patient for reading a telescopic lens which the patient enjoyed very much, since he could not read with ordinary lenses. About a year later his vision had failed so that he had great difficulty in reading ordinary print with this glass, which was plus eight. By increasing this to a plus twelve he was enabled to read ordinary news print. The cost of this change was about fifty dollars.

Dr. W. H. Luedde asked whether telescopic lenses were used successfully in inoperable cases.

Dr. W. E. Shahan reported some successes and some failures with telescopic

lenses. About fifteen or twenty years ago he had tried out an experimental telescopic lens, though it was not recognized by that name at the time.

DR. J. H. GROSS said he thought that the magnifying glass showed a larger image than the telescopic lenses, though the field was smaller.

DR. LEO L. MAYER said that the purpose of his paper was to show the wonderful results of the telescopic glasses. Patients were told that in six months they probably would not see so well as when they were given the lenses. Binocular vision with these lenses could be obtained for distance but not for near vision.

An attempt had been made to get some one interested in making a similar combination which was not so complicated and could be used for clinic patients and for those who could not afford to pay such high prices. A telescopic magnifier which was in reality a field glass was put out by Zeiss. It could be used with both eyes for distance and for near. It had an attachment for focusing for near vision. Repeated trials of it had not proved it very successful. Zeiss also made a head band with a stand to hold the magnifier.

The advantage of telescopic lenses was that the focus was fixed, while with the magnifying glass it became necessary for the patient to adjust the focus while holding the glass in his hand.

Amblyopia from optochin-base poisoning

DR. B. Y. ALVIS read a paper on this subject, published elsewhere.

Discussion. DR. JOSEPH CHARLES said that formerly quinine was given more often and in larger doses than it was given today. He cited one case of the use of optochin, followed, after it failed, by a large dose of quinine. The patient recovered. The dose was sixty grains of quinine. In a case of old trachoma twenty grains of quinine was given in twenty-four hours and the infiltration and ulcers cleared up.

DR. W. E. SHAHAN mentioned a few cases that had come under his observation. One patient was given by mistake one hundred and twenty grains of quinine. This produced a similar picture to that which Dr. Alvis had described. The patient was blind. The dose was about one grain per body weight. Recovery followed slowly, but sight eventually became normal. This case had been under observation for the past ten years. The veins and arteries had become enlarged, and though there was not much atrophy there was difficulty in seeing a swiftly moving object.

A second case of quinine poisoning was that of a patient in labor under the care of a midwife who had given four hundred and eighty grains of quinine in one day. The patient recovered telescopic vision.

The third case was of a nurse at the Saint Louis Maternity hospital. Examination revealed the presence of twilight blindness with small fields. Her history disclosed that when a young girl in Louisiana she was supposed to have been blind from malaria for a year, during which time she was dosed with quinine.

In each of the three cases a dose of 120 grains or more had been administered. Apparently optochin base had much more toxic effect than quinine.

DR. M. JACOBS called attention to a phenomenon which he had noted in connection with the use of optochin for the relief of conjunctivitis. The prescription was renewed and the patient used the new prescription only three or four times when he came to the office very much excited, stating that his pupils were dilated. Naturally the first thought was that the druggist had made a mistake and had given him atropin, but no evidence of a mistake could be found. Upon investigation it was found that Bedell had noted this phenomenon.

DR. JACOBS had used optochin many times but in no other case had dilatation been produced.

DR. M. H. POST had seen one case of quinine poisoning twenty-five years after the original attack, as reported in his father's records. This case still had

good central vision, a very pale disc, and markedly narrowed vessels.

DR. LAWRENCE POST mentioned the case of a two-and-a-half-year-old boy who had been given sixty-two grains of quinine in three days. Vision began to return in about six weeks. Fairly good recovery followed, with restitution of central fields but much constriction of peripheral fields and marked optic atrophy. When last seen the boy had just finished a year's course of triweekly treatments from a chiropractor and his partial recovery was attributed by the parents to this treatment.

DR. ALVIS (closing) spoke of comparative dosage. According to Dr. de Schweinitz, one to one and three-fourths grains of quinine per pound of weight would produce amblyopia in dogs. Cases previously reported had shown toxic effects from doses of thirty grains and up. In the case reported only twenty grains a day was administered.

One point of interest in these cases was the prognosis. The case here reported had looked quite hopeless at first, but finally recovered some vision as all reported cases had done. But one could predict a certain amount of permanent damage even in mild cases.

LEO L. MAYER,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

March 21, 1929

DR. C. E. G. SHANNON, chairman

Massive exudative retinitis

DR. SYDNEY L. OLSHO presented a case in a young woman nineteen years of age whose mother had died of brain tumor at thirty-six years of age and the father of a stroke at seventy-four years of age. One sister had bilateral retinitis pigmentosa. Two brothers and four sisters were in fine general health. Her maternal grandfather and two aunts had died of tuberculosis. The patient was in splendid health. Physical examination was negative. Wassermann and Pirquet tests were negative.

Cilium in the anterior chamber

DR. GEORGE H. CROSS presented the case of a young man twenty-six years of age, who was referred because of a foreign body in the cornea of the left eye. Upon examination there was discovered a large cilium, one end of which apparently was fastened to the posterior surface of the iris at about three o'clock. The free end projected forward and nasally entirely across the pupillary space.

Upon questioning the patient it was found that seventeen years ago he had been struck in the left eye with a heavy piece of steel spring. There was a scar on the cornea showing the probable wound of entrance of this cilium. There was no apparent cyst formation and the patient had no discomfort. Removal of the cilium was not contemplated as the patient said he had no trouble and was satisfied to let well enough alone.

Investigations on the crystalline lens

DR. ALLAN C. WOODS of Baltimore read a paper telling of the work of various investigators along this line. He said that we were still a long way from the solution of many problems involving the crystalline lens.

Discussion. DR. FRANCIS HEED ADLER said that, in spite of much new light on the subject, the more the problem was studied the more complex it appeared, as exemplified by the fact that now Dr. Woods was forced to speak of a gamma crystalline in addition to the alpha and beta forms previously recognized. The discovery by Gowland Hopkins of glutathione and its application to the autoxidation system of the lens by Goldschmidt, Adams, and others had further burdened us with a vast number of intricate problems which must be solved. There was, however, the consolation that after accumulation of many apparently unrelated details the common factor appeared and the problem was solved.

DR. I. S. TASSMAN said that Dr. Woods had found the gamma crystalline to be an albumin. In an earlier work, Woods and Burkey had noted that beta crystal-

line underwent spontaneous precipitation on withdrawal of the alpha fraction, which seemed to support the view that senile cataract formation was at least accompanied by disappearance or replacement of the soluble cystein containing elements of the lens. It was not until 1921 that Hopkins discovered that cystein existed in the tissues in combination with glutamic acid as a dipeptid, to which he gave the name of glutathione. This substance showed the same oxidation-reduction properties in the tissues as attributed to cystein, and was responsible for the presence of a positive nitroprusside reaction. Now, since the nitroprusside reaction was present in normal lens and absent in cataractous lens, it could be assumed that glutathione was not present in cataractous lens in its reduced form, which was the case in normal lens.

Cataract extraction in the capsule

DR. ARNOLD KNAPP reported his third hundred successive cases. After defining the type of senile cataract which was suited for this procedure, he spoke of the technique in the use of the capsule forceps and the method which he usually followed, emphasizing the necessity of first subluxating the cataract before extracting in the capsule. The visual result in seventy-four out of one hundred cases was 20/30 or better. Vitreous was lost in seven. Iritis occurred in eight cases. Wound reopening with hyphema occurred in ten cases; expulsive hemorrhage in two. Of these one required enucleation; in the second some sight was preserved. Detachment of the retina occurred after one year in one case, and after a year and a half in a second case, the vision at first after operation being normal. There was prolapse of the iris in one case. Glaucoma occurred in no case unless as a part of cyclitis. In two cases glaucoma preceded cataract; after intracapsular extraction tension remained normal.

Discussion. DR. LUTHER C. PETER said that he felt that all beginners and older operators whose extractions during any single year were comparatively few should not do intracapsular extraction. If we eliminated the surgical skill required for either method and compared the results of the two methods, there could be no reason for a difference in opinion as to the much greater value of intracapsular extraction. As pointed out by Dr. Knapp vitreous loss, iris incarceration, vitreous opacities, after cataract, and secondary glaucoma were all reduced to a minimum. Recovery was more rapid, and was uncomplicated, and a high degree of visual acuity was assured. Personally, he was disappointed when central vision of 6/6 was not obtained, and 6/5 or even 6/4 was more frequent than less than 6/6.

Upon other occasions, he had raised a protest before this section against discission for after cataract, which was so often made necessary by capsulotomy methods, especially when the somewhat antiquated cystitome was used for rupturing the capsule. In his experience, there was no intraocular operation which was attended by more danger than discission of an after cataract. Obviously this operation could be avoided by removal of part or all of the anterior capsule by toothed forceps. Even under these conditions, there was an annoying complication of which Dr. Knapp had not spoken, which made its appearance one or two years after the extraction, and reduced vision unless it was met by a discission. He referred to epithelial activity, which might develop if any part of the proliferating section of the capsule was left in the eye. All these complications were eliminated by intracapsular methods. In an uncomplicated case, Dr. Peter preferred to use smooth Kalt forceps to complete the extraction, a Smith expression hook being used but little and with the slightest pressure. In his experience, if the lens were slowly withdrawn vitreous would not follow. On the other hand, undue pressure with the Smith hook might cause vitreous presentation.

The point for grasping the capsule was of much importance. If it was grasped near the lower border of the pupil, tumbling of the lens on delivery was insured, and breaking of the zonula

was easier than when grasped at a higher position. Furthermore, if the capsule ruptured, as it occasionally did, the anterior capsule in the pupillary space was in the grasp of the forceps and was removed, and needling for an after cataract would not be necessary. If the capsule was grasped above as recommended by Verhoeff, a rupture of the capsule would be above the pupillary space, and a discission might be necessary.

DR. C. E. G. SHANNON said that he had been privileged to see Dr. Knapp perform the intracapsular operation on twelve cases. He was impressed first with the thoroughness with which the eye was placed under control prior to operation; second with the delicacy and deliberation on the part of Dr. Knapp in carrying out the entire operation; third with the clear black pupil that was shown following delivery of the lens—a delight to every operator—and lastly, and of considerable importance, with the absence of any accident in all of the twelve cases.

DR. G. ORAM RING asked Dr. Knapp whether he routinely did a complete iridectomy in connection with his removal of the lens by subluxation with the capsule forceps. Dr. Barraquer elected to excise a small piece of iris midway between the pupillary and ciliary border, and a recent communication from another operator suggested the propriety of omitting the iridectomy altogether. Dr. Ring noted that Dr. Knapp had had two choroidal hemorrhages in this last list of one hundred cases, and Dr. Ring was interested to know how many accidents of this type Dr. Knapp had had in his entire intracapsular series of three hundred cases. His own experience in that particular type of tragic accident in a series of 2,500 extracapsular cases had been only one choroidal hemorrhage in each five hundred extractions, and he was under the impression that Dr. de Schweinitz' experience had been similar.

DR. LEIGHTON F. APPLEMAN stated that during the winter just past he had had ten cataract cases in which the lens had been extracted in its capsule. In three he had used the loop, carefully breaking the zonule at its upper border and gently insinuating the loop beneath the lens and delivering it without loss of vitreous. In the others delivery was effected by pressure below with the Smith hook but difficulty was experienced in breaking the capsular attachments below and in some cases there was slight loss of vitreous, which, however, did not interfere with prompt healing.

DR. KNAPP agreed with Dr. Peter that discission in many cases was difficult and the proliferation which took place from the margins of the cut capsular wound frequently interfered with final vision. This same proliferation had occurred occasionally in the anterior layers of the vitreous in the intracapsular cases.

In answer to Dr. Ring, an iridectomy was always done at the time of operation. He doubted whether the choroidal hemorrhage could be ascribed to the operation. When expulsive hemorrhage took place, the presence of the suspensory ligament and posterior capsule would not restrain it.

In answer to Dr. Holloway, he was of opinion that the detachment of the retina which had occurred in two of these cases could not be ascribed to the operation. Still it was difficult to convince the patient of this.

In conclusion he did not wish to say that the only way to subluxate a cataractous lens was with capsule forceps. He thought it was the simplest way, as we were all experienced in handling a pair of forceps. He was convinced that the tumbling method was essential to the safety of the operation, and he felt this was a method by which the advantages of the intracapsular operation could be obtained without subjecting the patient to the difficulty and risks of the original Smith technique.

Important phases of a satisfactory senile cataract extraction

DR. LUTHER C. PETER read the paper on this subject which appeared in the September, 1929, issue of the American Journal of Ophthalmology.

Discussion. Dr. Edmund B. Spaeth said that before flap sutures were used iris prolapse had been entirely too frequent. As soon as an apex suture was used the incidence of this complication was reduced very much. It still occurred, however, though less frequently. During the operation, one could see the reason for this quite readily. The unopposed pull of the superior rectus caused gaping of the corneoscleral incision. The operative defect thus formed was in the shape of a crescent, concavity downward. As soon as the suture was placed this crescent was subdivided into smaller crescents, one lying on each side of a vertical corneal meridian. They were now more nearly triangular in shape, with their convexities in apposition. On the other hand, with the sutures placed in the outer angles of the incision and at the junction of the outer and middle thirds, the operative wound was snugly closed, so that one had just a bit of difficulty in worming into the lips of the wound a flat irrigation tip or the repository spatula when this procedure was necessary. As a large incision facilitated proper lens extraction without undue pressure on the eye (with a traumatic iritis as the sequel of such pressure) it seemed even more necessary, if such an incision was made, that adequate sutures should be used. It was a basic rule in abdominal surgery that the incision should be sufficiently large to allow for proper manipulations. This was even truer with lens extraction. If for no other reason than that of sealing off potential infection from the vitreous chamber, sutures were indicated. The mental ease which these gave to the operator was not to be lightly dismissed.

Dr. A. G. Fewell,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

April 19, 1929

Dr. C. E. G. Shannon, chairman

Thiersch graft for symblepharon

Dr. Holloway exhibited a patient on whom he had operated for a symblepharon, resulting from a lime burn. The palpebral attachment of the adhesion occupied about eight millimeters in the central part of the lower lid, and extended to the margin; several bands crossed the fornix and were attached to the bulbar conjunctiva and the lower portion of the cornea which showed marked and complete vascularization.

Both extremities of the symblepharon were dissected free and the cul-de-sac deepened. The lateral portions of the bulbar conjunctiva were then undermined and the margins sutured so as to bring a flap over the cornea for about one to two millimeters. A piece of stent about five millimeters wide had been previously molded to conform in shape to the contour of the lower cul-de-sac and almost corresponding in length to that of the lower lid. Two "eyes" were then placed in each end of the stent, large enough to permit the passage of a needle. A Thiersch graft was taken from the thigh and, after shaping the graft about the stent, the latter was sutured in the lower cul-de-sac by means of a mattress suture at each end, which passed directly through the whole thickness of the lower lid. The loop of the mattress suture was placed between the inner surface of the stent and the outer surface of the inner fold of the graft. In this case, as with a previous one, a beautiful result was obtained.

Retinitis punctata albescens

Dr. Leighton F. Appleman presented a woman aged twenty years, of Jewish parentage, in whom this condition had been present since childhood and was probably congenital.

The chief symptoms were night blindness, with severe headaches which were aggravated by her close clerical work. Vision was O.D. 6/9—1; O.S. 6/9—4. This was improved to 6/6 in each eye by + 2.25 sph. + 1.00 cyl. axis 75 degrees in the right, and + 1.50 cyl. axis 80 degrees in the left. The visual field showed slight concentric contraction for form, which was increased when the fields were taken under reduced illumi-

nation. The color fields were greatly contracted.

External examination was negative. Ophthalmoscopic examination revealed hundreds of white, rounded, nonpigmented spots in the deeper layers of the retina and dispersed throughout the whole eye-ground in each eye. Both maculas were free from the spots. The spots were not associated with any pigmentary changes nor had there been any progressive loss of sight. These facts, together with the symmetrical distribution of the spots, pointed to the congenital nature of the condition.

The blood and urine examinations were negative.

Examination of two sisters and one brother of the patient revealed no ocular abnormality. The father and mother were first cousins. This fact had been commented upon in previously reported cases.

Reciprocal innervation in bilateral oculomotor paralysis

DR. FRANCIS H. ADLER presented a case of complete bilateral oculomotor paralysis which showed the following:

On extreme abduction to the right not only did the right eye turn out, innervated by the right external rectus, but the left eye turned in slightly toward the midline. On looking to the left the left eye could be voluntarily abducted and the right eye followed inward slightly toward the midline. There was no evidence of any power in any of the external ocular muscles save the external rectus on each side, therefore the movement inward of either eye must have taken place by relaxation of the tone of the external rectus muscle. This relaxation of tone in one muscle when its antagonist is innervated constitutes the well known reciprocal innervation first described by Sherrington. This paper will appear later in full in the Archives of Ophthalmology.

Glutathione in the crystalline lens

DRS. I. S. TASSMAN and W. G. KARR said that, employing the nitro-prusside reaction as a guide, some of the earlier investigators had concluded that the amino-acid cystein was present in the normal crystalline lens and absent in cataract lenses. Heffter later described the oxidation-reduction process of cystine due to the activity of the labile hydrogen atom of the SH radical present in its molecule, and pointed out its possible importance as a factor in cell metabolism in the tissues. The substance had not, however, been demonstrated in the tissues in its free state. In 1921 Hopkins discovered glutathione, which he described as a combination of cystine and glutamic acid, and after producing it from fresh yeast he also showed that it was present in the liver and other organs. Glutathione also showed the same oxidation-reduction property in the tissues and was considered necessary in the proper function of the cell. Hopkins estimated glutathione in the liver of the rat to the extent of 0.18 per cent; in the liver of the rabbit to the extent of 0.24 per cent. This was greater than the percentage found in other organs. Michail found it to be present in the lenses of oxen, rabbits, and dogs to an average of 0.356 per cent. This exceeded the percentage found by Hopkins in the liver.

In their own investigation, the authors had used freshly extracted pig lens from animals of uniform age and weight, and, after determining the percentage of dry matter (31.35), the percentage of glutathione was estimated in a series of seven experiments to be an average of 0.296 (according to the Perlzwig and Delrue modification of the Tunnecliffe method). The total cystine obtained (Folin and Looney method) was an average of 1.0 per cent. The cystine percentage was, therefore, 0.704, giving an average equilibrium ratio of cystein to cystine of 0.420. It was also found that the process of desiccation reduced the percentage of glutathione in the normal pig lens to 0.224 in a period of three to four weeks. A sample of fresh lens extracted with five per cent trichloracetic acid and allowed to stand at room temperature for twenty-four hours caused a reduction of glutathione to 0.106 per cent.

In freshly extracted human cataract lenses, the content of dry matter was found to be higher than in normal pig lens, averaging 35.5 per cent. In attempting to estimate glutathione in the cataract lens it was found that there was practically none present. The total cystine in cataract lenses was estimated at 0.80 per cent, which was lower than the similar content in normal pig lens. This total however represented all cystine, since it was found that there was no reduced glutathione present.

From these results it was seen that glutathione was present in the normal pig lens in definite amount. An equilibrium ratio was established also between cystein and cystine. In human cataract lenses, glutathione could not be found in sufficient quantity to estimate. The cystine percentage obtained in human cataract lens was 0.80.

The effect of various influences on the oxidation-reduction of cystein and glutathione had been described from time to time. Thompson and Voegtlin, in studying glutathione, felt that the toxic action of certain substances was due to a primary disturbance of the cellular oxidation-reduction process, resulting from a chemical interaction of the poison with the glutathione of the cell. In a long series of experiments, they estimated the percentage of glutathione in the liver of rats at 0.183 per cent (according to Tunnecliffe's method).

Future studies of glutathione and the development of methods for measurement of the oxidation-reduction potential in the tissues might add more to our knowledge of the crystalline lens and its change from the normal to the abnormal state.

The rôle of calcium in essential glaucoma

Dr. Joseph I. Gouterman submitted experimental, clinical, and therapeutic evidence suggesting two main premises and their possible intimate relationship, namely (1) a prevailing sympathetic hyperexcitability in essential glaucoma, brought about by (2) a calcium disturbance.

Calcium in the human blood was briefly discussed, pointing out the two forms of calcium, the nonionizable and the ionizable or electrolytic variety. The author favored the belief that the ionizable portion of calcium was diminished in glaucoma, the total calcium not necessarily being impoverished. The standard laboratory methods for determination of the various forms of calcium were mentioned, and the characteristic clinical features and their detection in cases of glaucoma were referred to. The paper was concluded with an outline of calcium therapy. Six cases, graphically illustrated, were reported.

Dr. A. G. Fewell,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY

April 20, 1929

Dr. William H. Crisp presiding

Retinitis pigmentosa

Dr. James M. Shields showed Mr. C. C. E., aged thirty-four years. His father always had some eye trouble, the nature of which the patient was not able to describe; his mother's eyes had always been normal. The patient had one sister, three years his junior, who had exactly the same condition as the patient but less advanced.

At the age of fourteen years the patient noticed night blindness which had gradually progressed until now he could not get about at night. The vision in the right eye was 6/25 with —3.50 sph. —1.00 cyl. axis 90°; left eye 6/32 with —2.25 sph. —1.00 cyl. axis 75°. The peripheral field was cut down to ten degrees in each eye. Both lenses showed typical posterior cortical cataract and the fundus picture was that of retinitis pigmentosa.

The patient's sister was also shown, although no study of her case had been made.

Discussion. Dr. William H. Crisp told of a family where three children were deaf. The eldest of these children showed unmistakable evidence of retinitis pigmentosa. The second child

complained of night blindness and showed slight pigmentary disintegration. The youngest child did not complain of visual disturbances but the fundi showed a mottled appearance. There was no consanguinity and no history of similar cases on either side of the family. The Wassermann was negative in each instance.

Traumatic aniridia

DR. JAMES M. SHIELDS also showed Mr. G. C., aged thirty-five years. The right eye was injured when the patient was a small boy, by a link of a chain striking the eye. The eye showed total absence of the iris, but a mass of pigment showed through the upper limbus. Through the perfectly clear cornea could be seen the lens' remains, which had undergone calcareous changes. The vision of this eye was reduced to light projection. The left eye was normal.

Discussion. DR. MELVILLE BLACK recited the case of a man who had been struck in the eye with a handball. The sclera was ruptured and the entire iris was literally swept from the eye. The iris was completely removed. The lens was unharmed.

Syphilitic interstitial keratitis with severe uveitis

DR. WILLIAM C. FINNOFF showed H. H., female, nineteen years of age, telephone operator, first seen August 25, 1929, with the history of failing vision for two and one-half months, and pain in the left eye. The vision of the right eye was 20/200, and that of the left light perception. In the right eye numerous nebulous infiltrates were present in the substantia propria. Small grayish deposits were present on the posterior surface of the cornea, and with the biomicroscope cells were seen floating in the aqueous. The iris vessels were congested, the vitreous filled with dust-like opacities, and through the vitreous haze numerous lesions in the choroid were indistinctly seen. The substantia propria of the left cornea was deeply infiltrated, and blood vessels entered the tissue. The pupil was widely dilated, but only an indistinct view of the fundus could be obtained. No details were visible. The Wassermann reaction was four plus.

During treatment with mercury and iodides the vision and eye had improved greatly. At present the corneal infiltrates were very much less dense and a satisfactory view of the right fundus could be obtained. Several larger patches of chorioretinal degeneration with pigment were visible, and some patches that still showed yellowish infiltrate in the choroid were present. In the left eye the opacities in the cornea and vitreous were more advanced, but large patches of dense yellowish choroidal infiltrate were visible.

Discussion. DR. SWAB (by invitation) stated that during the past eighteen months he had had under his care a case of traumatic interstitial keratitis on a syphilitic basis. In this connection he referred to a case reported by Hans Barkan which was precipitated by trauma. In his own case the first eye had become involved after a skull fracture, and in spite of all treatment the other eye had become involved.

DR. WILLIAM H. CRISP believed that neosalvarsan shortened the course of these cases, and he also advocated absolute rest in bed for these patients during treatment. One case was recited where the patient did not come under antisyphilitic treatment because of Christian Science objections, but atropin was used, the patient was put to bed, and the eyes cleared up very rapidly.

DR. PHILLIPS THYGESON stated that Dr. Verhoeff believed that antisyphilitic treatment was useless in these cases.

Metastatic carcinoma, or exudative macular degeneration

DR. G. H. STINE (by invitation) presented C. B., a white male aged sixty years. He had been first seen at the university clinic, March 25, 1929, giving a history of lowered vision in both eyes of two years' duration. There was otherwise nothing significant in the history. General health had always been excellent. Vision was less than 1/10

in each eye. On fixation, both eyes were directed about seventeen degrees to the right. The pupils were regular and reacted to light. Tension was normal to fingers. A few cortical striæ were present in both lenses, and the posterior pole of the right fundus was occupied by a large, disciform, paper-white mass about three or four disc diameters wide and three diopters in elevation. The upper and nasal margins were abruptly elevated, and at their bases were fringed with a small amount of bright red hemorrhage. The surface of the mass was fairly smooth, with only faint mottling, and seemed to slope off to the lower and temporal margins, which were flat and more irregular, and were thrown into two narrow crescentic folds suggestive of serous detachment. What seemed to be a scleral vessel coursed in the lower portion. The retinal vessels passed over the mass as in solid detachment. Numerous small, flat, white areas were grouped around the mass, with a larger, yellowish, softer looking one above. The entire fundus was intensely tessellated, with sparsely distributed migrating pigment in the periphery. The disc appeared slightly hazy. The retinal vessels were moderately sclerosed.

The left fundus showed a similar mass, but smaller and more irregular, the lower margin being also less well defined than the upper. The temporal margin resembled very much retinitis proliferans, the band extending downward and spreading out just below the mass. There was a small linear band of pigment on the lower portion. Between the mass and the papilla there were three or four smaller brilliantly glistening exudates composed probably of cholesterin crystals. The larger mass was grayish white. The tessellation of the fundus was similar to that in the right eye, and choroidal sclerosis was evident.

Form fields were full, and, even with very poor eccentric fixation, absolute and negative central scotomata were demonstrated. Complete physical examination revealed no evidence of neoplasm. Blood pressure was 185/80 mm., and arteriosclerosis with cardiac hypertrophy was diagnosed. The ethmoids, sphenoids, and antra were cloudy, and the tonsils were diseased. The blood Wassermann was repeatedly negative. The most recent examination showed little change in the condition, although the mass in the right eye seemed whiter, and the lesion in the left eye less disseminated. The patient thought he could see somewhat better.

The diagnosis was metastatic carcinoma, or senile macular degeneration with massive exudates, secondary to arteriosclerosis of the choroidal vessels.

Discussion. Dr. Edward Jackson believed that the diagnosis of metastatic carcinoma should be considered in this case. In one such case seen previously the elevations were flat and there was a comparative absence of pigment as compared with inflammatory exudates. He referred to two cases in the literature where the first evidence of carcinoma was seen in the eye and previous to ophthalmic examination had not been suspected.

Dr. Charles Swab (by invitation) anticipated more of a serous detachment of the retina in this case. He recited briefly the salient points in two other cases. In case 1 a woman aged sixty years had had a cancer of the breast removed five years previously. Six months prior to the time of ophthalmoscopic examination she had been exposed to intensive x-ray examination for metastasis in the lung. She complained of poor vision in one eye. This was caused by detachment of the retina. In case 2 a woman aged thirty-three years had been operated on for malignancy of the thyroid, following which there were metastases to the lung. Intensive x-ray therapy was used. A detachment of the retina of one eye was positively diagnosed after a period of some months.

Donald H. O'Rourke,
Secretary.

OXFORD OPHTHALMOLOGICAL CONGRESS

July 4-6, 1929

MR. A. BERNARD CRIDLAND presiding

Diseases of the lacrimal apparatus

DR. JOSEPH MELLER (Vienna) read the first paper. He discussed the frequency with which stenosis led to epiphora. Examination of a large number of cadavers, he said, showed that the lacrimal canaliculi were normal in only eighty per cent. It could be stated that most lacrimal passages were more or less diseased, but without conjunctivitis. Most of the subjects of this disease were women. Roentgen rays afforded the first means of satisfactorily seeing the normal pathological conditions of the sac in the living person. Often x-rays would give an indication of the kind of operation required. Radium applied to a tuberculous condition of the tear sac gave very successful results, so that operation was rendered unnecessary. Many ophthalmologists made the mistake of regarding epiphora as synonymous with stenosis of the lacrimal duct. Slitting of the canaliculi was now less often performed than formerly; and in all cases the operator must avoid slitting the canaliculus as far as the canthus. For dilatation of the tear duct the permanent probe treatment seemed to have been abandoned.

Turning to the medicinal treatment of chronic dacryocystitis with more or less copious secretion, Professor Meller said the condition could occasionally be favorably influenced, even cured, by medical means. Silver nitrate in one-quarter per cent solution, applied by the syringe, seemed best. Tincture of iodin had been used for the purpose, but it caused considerable irritation of the conjunctiva. After a properly performed extirpation of the sac, the epiphora, which before the operation was copious, almost always became so slight that the majority of the patients made no further complaint of it. If, however, a small particle of mucous membrane was left behind, lacrimation continued and might be as severe as before the operation. It was now recognized that intact canaliculi were not absolutely essential. Notwithstanding slit canaliculi, the epiphora ceased completely after the operation. Kofler's transseptal procedure had increased the view of the field of operation, so that every step of it was carried out under visual control. The operation was performed painlessly under local anesthesia, and the results were excellent, even in elderly people. Professor Meller advised ophthalmic surgeons, in cases of dacryocystitis in which operative interference was indicated, to extirpate the sac; a good extirpation was, he said, better than a poor dacryocystorhinostomy.

DR. J. S. FRASER (Edinburgh), rhinologist, read a paper on intranasal dacryocystotomy. His contribution was based upon ninety-nine cases, ninety of which had a diseased condition on one side only. The total number of operations done on them was 108. Most of them had already been seen by an ophthalmic surgeon before they came to him. In eighty-nine of the cases he was able to keep track of the patients subsequently, and sixty-seven of them were regarded as completely successful; that is, there was no recurrence of swelling in the tear sac, no pus could be squeezed out, and the eye did not water. The patients said that occasionally when they blew their noses they blew their eyes also. The most successful results were obtained in cases in which there was a definite collection of mucopurulent fluid in the tear sac. Had he tried to get patients to undergo treatment two or three times doubtless he would have obtained a better figure than seventy-five per cent of cures.

Discussion. MR. T. HARRISON BUTLER (Birmingham) said he had had only four or five cases of troublesome epiphora after extirpation, and in most of them, on reopening the cavity, he had found a relic of mucous membrane. On removing this, the epiphora ceased. A very serious possible complication was ulceration of the cornea from accidental injury during the operation. He related two such cases which he had seen.

MR. E. D. D. DAVIS (London) gave a

short review of the subject from the rhinological point of view, instancing cases in illustration, and demonstrating a series of slides.

Dr. S. H. Browning (London) had a good word to say for optochin in pneumococcic infections, which were common in the lacrimal sac; this remedy must, however, be used freshly prepared and with discrimination. He referred to the frequency with which streptothrix infections of the canaliculi existed and were not diagnosed. Patients who had these infections usually were found to be dealing with horses, and the infection was probably derived from dried horse manure.

Mr. D. Leighton Davies (Cardiff) said he did not regard a patient who had had a West operation done on him as cured unless he was still well three months afterward. Though it could be guaranteed that every patient would go out of hospital cured, a month or so later contraction of the scar might have set in; 24 of 38 of his cases since 1912 had been permanently cured. There was a group of cases in which no complaint of epiphora was made afterward, but in which fluid could not be got through into the nose. These he did not regard as complete cures, and he had not included them as such. Toti's operation was, he considered, best suited for young people; he had ceased to do it on patients aged fifty-eight years and over, as they were liable to hemorrhages.

Mr. A. Greene did not think the nose operation was satisfactory for a diseased lacrimal sac.

Vascularisation of the vertebrate eye

Miss Ida Mann, delivering the Doyne lecture, said that arrangement of the intraocular blood vessels showed many remarkable variations in different species of vertebrates. If the subject was studied from the point of view of comparative embryology, it became possible, by investigating stages of development common to several dissimilar species, to arrive at a classification of adult types based on their mode of production. Although in most animals one type of ocular vascularization corresponded with one class of vertebrates, yet there were many instances of overlapping, as when the lower reptiles showed amphibian characteristics, and of convergence, in which a similar structure was found in two entirely unrelated species, for example, in snakes and in rodents. So far as was known, these exceptions could not be correlated with similarity in other respects, except, possibly, with similarity of visual acuity.

For discussion purposes Miss Mann divided the ocular vessels into three sets: those of the choroid, those of the retina, and those of the iris. In this lecture the choroidal vessels were not considered in detail. She showed that the variations in the retinal and iridic vessels depended, developmentally, upon modifications of the proximal and of the distal end, respectively, of the hyaloid artery, which was present in all vertebrates at some embryonic stage. Its proximal end might undergo four possible modifications, and these produced the four main types of retinal vascularization. They were: (1) complete atrophy of the vessel produced an avascular retina nourished entirely by the choroid; (2) vascularization of the epithelial cells on the optic disc, producing a pecten, a structure typical of the birds; (3) branching of the hyaloid proximally in the vitreous, producing a membrana vasculosa retinæ; (4) branching of the hyaloid proximally in the retina, producing the arteria centralis retinæ of the primates.

It could be shown that the presence of a pupillary membrane during development had a marked influence on the definite iris pattern. Those mammals which possessed it showed, in adult life, two types of circulation in the iris: a direct arteriovenous anastomosis in the superficial layers, and a capillary circulation in the deeper parts. Animals not possessing a pupillary membrane showed only the capillary system, and in them, too, there was a much greater range of iris pattern.

Ocular manifestations in head injuries.

Mr. Hugh Cairns (London) said that

in the past undue attention had been paid to the fracture of the skull which often followed a blow on the head. Certain of the ocular manifestations of head injury, such as damage to the optic and abducens nerves, were produced by the fracture, but as a general rule the important element of a head injury was not the fracture of the skull but the injury to the underlying brain.

The greatest surgical problem was to know which cases would benefit by operation. Some patients would inevitably die soon after the injury, such cases being seen in greater numbers with the increased speed of locomotion. In other cases it was soon evident, after the concussion had passed off, that the injury was comparatively mild, and that with suitable conservative treatment the patient would recover. There remained a third group, in which the outcome was for a time uncertain. This comprised cases in which, after recovery from the initial unconsciousness and concussion, there was either a relapse into coma or alternating periods of stupor and lucidity; and cases in which concussion did not occur, and unconsciousness only came on at an interval of hours or days after the accident. In this group the symptoms were usually due to a rise of intracranial pressure as a result of intracranial hemorrhage or of edema of the injured brain, or to disturbance of the circulation of the cerebrospinal fluid. It was often very difficult to decide which were the cases that would benefit by operation. In arriving at a decision about this, the patient's state of unconsciousness was the most useful guide. A blow on the head tended not only to damage the brain at the site of the impact, but also at other places, especially at the opposite side of the brain.

Slight blurring of the discs could be seen in many cases which at operation showed a large blood clot, severe cerebral edema, or a collection of cerebrospinal fluid in the subdural space. In eighty cases of head injury which he had seen in civil life there were only seven of definite papilledema. When papilledema was present, the patient should have operative treatment, even though at the time he might be relatively free from symptoms. A well planned decompression would give the patient a much better chance of avoiding the chronic ill health which otherwise so often followed head injury. Lateral deviation of the head and eyes towards the injured side was very important as indicating the side of the main lesion. Great reliance could also be placed on dilatation and fixity of one pupil as indicating that the major cerebral lesion was on the same side of the body. This sign was particularly valuable when other neurological evidence seemed to indicate that the lesion was on the opposite side. The whole subject of pupillary reactions in head injuries was worthy of close investigation. Mydriatics and morphia should never be used in cases of head injury.

Finally, the speaker dealt with disturbances of vision in persistent cerebral contusion after a blow on the head.

Mr. Charles Goulden dealt with the subject from the ophthalmological aspect. He began by referring to Mr. Bathe Rawling's Hunterian lectures of 1904 on fracture of the skull, which shed valuable light, he said, on several problems, and laid down principles of diagnosis whereby the probable course of fracture could be predicted if the site of the blow was known. Sixty to seventy per cent of cases of fracture of the base were shown to be due to direct violence applied in the neighborhood of the base of the skull, whereas thirty to forty per cent of basal fractures were due to radiation from fractures of the vault.

The path which a fracture of the base might take was largely determined by the various fissures and foramina of the base. Rawling had shown that a fracture involving the optic canal might occur in any fracture of the skull, and such a fracture was more probable when the injury to the head was in the neighborhood of the orbit. In a certain number the result was partial or total primary optic atrophy, the lesion being in nearly all cases unilateral.

After a blow on the head, usually near the orbit, and perhaps not sufficiently severe to cause unconsciousness, the eye on the side of the injury was blind. The pupil was dilated and inactive, there was no perception of light, and the ophthalmoscope revealed no pathological signs. After an interval of two to six weeks the appearance of primary optic atrophy was found with normal blood vessels. In fracture of the middle fossa there might be injury to the optic chiasm, due to laceration by a fragment of bone, crushing, or compression, and the optic tracts were exposed to some similar injury. Such injuries would lead to defects in the visual fields; and cases had been reported of bitemporal hemianopsia, presumably due to laceration of the chiasm in its inner part. There might be total blindness in one eye and temporal hemianopsia in the other.

Mr. Goulden drew attention to the value of the pupillary reactions in cases of injury to the optic nerve in fracture of the skull. The other nerves liable to injury in fracture of the base were the oculomotor, the trochlear, the trigeminal, the abducens, and the facial. The nerve most commonly involved was the abducens, with consequent paralysis of the external rectus. But in that event there was usually an involvement of the other nerves which passed along the cavernous sinus and through the sphenoidal fissure. The fifth nerve was rarely affected in fractures of the base of the skull; the facial was that most involved in these accidents; Boehm found it involved in twenty-two per cent of cases of fractured base.

Mr. Jameson Evans pleaded for cooperation between the general and the ophthalmic surgeon in these matters. He related two cases of his own in which unilateral partial blindness followed being thrown off a bicycle, the external angular process receiving the force of the impact. There was an absence of ophthalmoscopic changes for the first few weeks, then there ensued optic atrophy of the nerve on the same side. The nature of such a lesion was difficult to explain.

Mr. T. Harrison Butler said that all the cases he had seen of motor bicycle accidents had either blindness or paralysis of one or other ocular muscles; they were not commonly combined.

Mr. N. C. Ridley referred to a discussion among ophthalmologists in which none of the speakers had seen optic atrophy following simple concussion, though Mr. Lindsay Johnston said he had frequently seen it in the London Zoological Gardens.

Mr. Collyer Summers described the case of a man who, following an accident, had primary optic atrophy on the temporal side. The man was seen on several occasions and the field remained constant throughout.

Mr. H. M. Traquair (Edinburgh) referred to cases in which the line of division of the field was horizontal. Complete recovery of vision did not show that the optic nerve had entirely recovered, as there might remain a peripheral defect of slight degree.

(Reported by H. Dickinson.)

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THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

The international congress of ophthalmology which met in Amsterdam was not only a congress of ophthalmology but a congress of peace; a congress of scientific thought, throughout which existed and blossomed at every opportunity demonstrations of personal good will, of international fellowship, and of a strong desire for mutual helpfulness and understanding. In the assembly rooms and in the hotel corridors, at banquets and luncheons, German and French, Spanish and Italian, Japanese and Russian, Swedish and English, Dutch and Hungarian formed a kaleidoscope language, and no matter what the tongue the thoughts conveyed all centered on bringing us together, not only as ophthalmologists but as friends.

Such a feeling of good will could scarcely fail to be in evidence in view of the hospitality extended us by our hosts. Not enough can be said of their welcome, of the surrender of their own time, energy and interests, and of the whole hearted entertainment provided. From the president down to the charming young ladies who looked after our mail, invitations, hats and coats, and who directed us hither and thither in a dozen different languages, there flowed a steady current of helpfulness, consideration, and interest in our welfare. It is impossible to fully express to our hosts the warm regard in which we hold them. We can only hope for an opportunity some day to return their hospitality.

The congress was opened by the Queen Mother, with a simple and cordial address of welcome, followed by a few words from representatives of all the nations in their various languages. From this point on, scientific sessions and social affairs, excursions for the ladies, banquets, luncheons, and receptions at the palace followed in a steady stream. The sessions were held in

three halls simultaneously in order to cover the mass of material presented. One could wander from one to the other, hearing in the space of a few minutes a paper in English on a biochemical ocular problem, one in French on glaucoma, and one in German on intracapsular extraction. At a luncheon given for Professor Hofrath Ernst Fuchs by the Americans, Mr. Treacher Collins and Dr. George E. de Schweinitz spoke and we all cheered the "Old Master". Professor Axenfeld was presented with the Howe medal by the American Ophthalmological Society. And so once again the science of ophthalmology acknowledged and applauded, in and out of meetings, the good work of all its men from all the different countries.

Certain definite trends of research and interest in clinical and laboratory problems made themselves felt; glaucoma, as always, both as regards etiology and therapy, a subject open to prejudice, marked differences in clinical judgment, and lacking a definite base of action; detachment of the retina, with most promising results and many cures reported from operative procedures based on finding and scarifying the tear in the detachment; cataract extraction in the capsule, with elaborate as well as clumsy methods discarded, and a certain rationale in indications and proceedings becoming established. It is not, however, within the scope of an editorial, nor would it be possible in an article of much greater length to discuss the scientific aspects of the congress. The Transactions, a volume which should not be missing from any ophthalmologist's library, will bring the original papers and discussions.

Hans Barkan.

"DRUMMING UP TRADE"

In another part of this Journal (page 928) will be found a courteous letter from one of our nonmedical readers, protesting against Dr. Ellett's contention that "optometry" is not a profession (see page 764 of our September issue).

Our optometric correspondent urges that, while there are a great many optometrists who try to "drum up trade", this fact is not a proof that the whole optometric profession is unethical.

The word "optometry" has acquired in this country a more limited application than on the continent of Europe. Among the French it is commonly employed to signify measurement of ocular refraction, whether by a physician or by any other person. In the United States, by those among the opticians who were particularly aggressive in their claim for professional status as refractionists, the term was selected some years ago as a new title around which they could rally in their attempts to impress the public and the legislators with their quasimedical qualifications and standing.

The designation "optometrist" has been objected to by ophthalmic physicians because it was applied to people who for the most part were ignorant alike of ophthalmology and of optometry in the proper sense of the word. Nevertheless, many ophthalmic physicians have been frank to admit that there existed here and there optometrists who were exceptionally capable and well trained in the measurement of refraction, and whose professional spirit was remarkably free from the grosser commercial instinct.

It is true, as our correspondent remarks, that the standards of optometrists and of boards of optometric examiners are being raised; and this should be a matter for congratulation among those ophthalmic physicians who recognize that the optometric "profession" has not only come to stay but is likely to develop to a much more distinguished position than it now occupies in the healing art.

Unfortunately, the vast majority of refracting opticians or optometrists are still combining two purposes, namely the professional purpose of correcting a bodily defect, and the commercial purpose of selling as many new spectacle frames and lenses as possible. In the long run it will be found that the best professional results can not be attained

by mixing these two purposes, and the definitely professional optometrist will devote himself more and more exclusively to the measurement of refractive errors. He will then rent an office instead of a store, he will gradually reduce his activity as an advertiser, he will divide his time for making definite appointments with patients, as does the more systematic ophthalmic physician, and last but by no means least, from an economic standpoint, he will arrange his fees upon a professional instead of a commercial basis and will divorce himself entirely from the pretext that he examines eyes for nothing and charges only for frames and glasses.

Here and there, in every large city, are one or two optometrists who have already acquired a relatively professional status along these lines, and whose work and professional spirit alike will compare favorably with the average refraction work, and the average professional attitude, among the ophthalmic physicians of this country. Some day, perhaps, two or three of the youngest of this optometric vanguard will find themselves the deans of a well developed profession. But that is far to look, and it is safe to say that any such development will be accompanied by preliminary and scientific educational standards little if at all inferior to those demanded of doctors of medicine and surgery.

In the meantime, let us put and keep our own house in order.

"Drumming up trade" is not unknown among ophthalmic physicians. It is to be feared that some of them have a point of view quite as commercial as that of the average refracting or dispensing optician. Those who, for work which they themselves have not performed, accept monthly rebates from wholesale optical houses, while the patient believes this part of the expenditure to have been made purely to the optician and not to the physician, can hardly throw stones at the commercial spirit of the optometrist.

In the main, the technique for self-advertisement among the medical profession is greatly more refined than the practices which Dr. Ellett decried and which our correspondent protests are not universal among his colleagues.

The issuing of circular letters of invitation to private hospitals or clinics is surely not altogether professional in purpose. Medical essays and addresses before either medical or lay organizations are not always conceived purely from altruistic or scientific motives, nor are all reprints circulated because the authors fear that their recipients would otherwise be deprived of valuable opportunities for medical education. Luncheons, dinners, and other invitation parties, as well as Christmas and other gifts, are sometimes written off, in the mind of the donor, to the professional "expense account". Publicity values are to be found in the paragraphs of the society column of the newspaper, or even in the news items of the medical journal.

As to professional qualifications, let us not forget that refraction, in theoretical knowledge and in daily practice, is still, even among physicians who profess ophthalmology as a specialty, one of the most lamentably neglected branches of medical art.

There are many ways of obtaining professional advancement, and some of them are legitimate and harmless, although they serve the purpose of "drumming up trade". But the grosser methods which may be excusable in one who is merely a salesman are not permissible in one who claims professional standing; and such grosser business methods can not be associated with professional purposes without debasing them.

W. H. Crisp.

DARK ADAPTATION

Various writers have studied the importance of a modified threshold of dark adaptation as a diagnostic sign in the early development of glaucoma, at a stage preceding loss of vision, defects in the visual fields, or increase of tension. More recently, important work on this problem has been done by Derby and his colleagues. Among other condi-

tions in which the study of dark adaptation has been thought to have significance is the differentiation between optic neuritis and papilledema.

Unfortunately, most glaucoma patients are likely to present themselves for examination after the more obvious symptoms of the disease have developed, so that the value of study of the light sense for diagnostic purposes may prove relatively limited, at least so far as concerns recognition of the presence of glaucoma in the first eye involved. Inasmuch, however, as dangerous involvement in the second eye commonly appears at an appreciable interval of time after symptoms have become evident in the first eye, the value of tests for the light sense will probably lie in the early detection of a tendency to glaucoma in the second eye.

The investigations made by Derby and his colleagues at the Massachusetts Eye and Ear Infirmary showed that of those patients who developed clinical glaucoma while under observation the majority had an elevation of the light minimum curve; and there was ground to believe that the patients whose light minimum increased were more likely to develop glaucoma than those whose light minimum curve remained consistently low, while the rise of light minimum curve was often the earliest sign of glaucoma. (See also this Journal, 1928, July, page 570.)

Möller, who has already published an extensive study of dark adaptation, now gathers together in a monograph of nearly 150 pages (Acta Ophthalmologica, 1929, volume 7, page 1) the details and results of his various series of experiments; and some of his conclusions will have special interest for those who are seeking to apply to clinical purposes the most advanced scientific knowledge of this somewhat obscure department of ocular physiology.

Möller found that all adaptation curves were logarithmic in form and showed from minimum to maximum a uniform course without the least trace of sudden transitions such as might be taken to indicate that adaptation consisted of two factors of different nature, representing the respective functions of the rods and cones.

During maximum adaptation the visibility of an object depended upon brightness and area of the test object in a reciprocal ratio which was approximately constant so long as the test object was not excessively large or small.

Möller definitely recognizes adaptation for red, which has been denied by other authors; and he finds that when adaptation for red comes to an end the center of the visual field is blind. Foveal vision with low illumination showed reversal of Purkinje's phenomenon, that is to say, red was visible while green and blue were not perceived during fixation. This relationship the author took to indicate that the shorter wave lengths were intercepted by the retinal pigment, rather than pointing to an influence of the absence of rods in the central area.

The visual acuity curve during the process of adaptation showed a "plateau", that is, visual acuity remained normal through a range of illumination whose maximum was one thousand times its minimum, whereas below this minimum the fall in visual acuity corresponded to a straight line, so that brightness of illumination was measurable in terms of visual acuity.

While Möller's monograph is accompanied by an apparently exhaustive bibliography of 145 references, a much more complete list of authors and titles in dark adaptation and closely related subjects is to be found in a review of the literature prepared by Dorothy Adams, and just published by His Majesty's Stationery Office for the Medical Research Council of Great Britain (Committee upon the Physiology of Vision). Adams' review covers about 110 closely printed pages, to which is added a list of close upon nine hundred references.

The existence of so great a mass of literature upon this one topic is a sufficient indication alike of its importance and of the difficulties involved in its clinical application and scientific elucidation. *W. H. Crisp.*

THERMOPHORE TREATMENT

For various conditions about the eye which do not yield easily to other therapy, the application of known amounts of heat by means of the thermophore is very simple and extremely useful. Unfortunately, although this most valuable therapeutic instrument was first introduced more than fifteen years ago, ophthalmologists are not using it nearly so much as they should, so that a brief reiteration of purposes to which it may be applied is here undertaken.

Few conditions are more difficult to treat than slowly spreading, fairly dense, white infiltrations of the substantia propria of the cornea, starting near the limbus and extending toward and past the center of the cornea. The dense area is usually preceded by a halo of light gray. These peculiar lesions are probably tuberculous in character, and occasional luetic cases may be excluded by the Wassermann or a therapeutic test. Usual forms of treatment fail utterly, yet the disease is promptly arrested by application of the thermophore at 145 degrees for one minute. This arrest is followed by gradual clearing of the opacity.

Another corneal lesion, not extremely rare, consists of a greasy, foam-like elevation extending superficially from the limbus over a circumscribed area of cornea and outward over the conjunctiva. Removal of this material by scraping is followed by recurrence, but application of the thermophore at 135 degrees for one minute is most efficacious in causing its disappearance.

Another lesion which is very resistant to various medicaments is granuloma at the lid margin, probably due to disease in the duct of a meibomian gland. Usually this is from three to five millimeters in length and about two millimeters in thickness. Excision is curative but leaves a scar which often causes an inturning of the lashes at this point. These little inflammatory tumors yield readily to heat of 140 to 150 degrees applied for one minute. Novocaine infiltration anesthesia will avoid any discomfort associated with the application.

Xanthomata, when not very large, usually disappear after one thermophore treatment. Here again a temperature of 145 degrees should be used for one minute, and here also novocaine infiltration is desirable, because fairly firm pressure must be made on the plaques. Considerable swelling will be noted on the day following treatment. This, however, soon subsides, and the xanthoma comes off in about ten days or two weeks in the form of a scab. Occasionally a second application is necessary. The final picture is that of a very small pink scar, usually smaller than the scar from excision. The method has the virtue of practically banishing the danger of recurrence, which is not uncommon after removal by dissection.

The use of the instrument for pneumococcus ulcers and epitheliomata is so well known that comment seems superfluous.

Failures are oftenest due to lack of attention to detail, especially as to having the temperature absolutely as recommended, and as to maintaining uninterrupted contact for the length of time advised.

These are only a few of the uses of the thermophore. There are other conditions which will be benefited, and for the ophthalmic physician familiar with the instrument many opportunities for its utilization will suggest themselves.

Lawrence Post.

BOOK NOTICES

Die Radiumbehandlung in der Augenheilkunde (Radium treatment in ophthalmology). By Dr. Leo Kumer, university professor, Innsbruck, and Dr. L. Sallmann, assistant in the second university eye clinic in Vienna. 138 pages, 65 illustrations in the text, octavo, paper covers. Price 14.40 marks. Vienna, Verlag von Julius Springer, 1929.

The book presents with rare accuracy the ripe experience and study of the

two authors, of whom one is a radiologist and the other an ophthalmologist, regarding the effect and value of radium in diseases of the eye. The clinical experience which forms the basis of their conclusions comes from the university eye clinic and from the clinic for dermatology and syphilology, both of which are connected with the Vienna radium station. An extensive bibliography, and author and subject indices, are at the end of the book. A glance at the table of contents shows the structure of the book to be in the form of an outline dividing the book into two main divisions; the first deals with the general properties of radium and the other with its clinical application in ophthalmology. Each division of the book is subdivided again and again, and the topical headings, which are printed in heavy face type, diminish in size with each subdivision. The parts describing the technique of radium application and the use of radium in diseases of the lids are profusely illustrated.

A few years ago the reviewer had an opportunity to see Dr. Kumer's work, and was impressed with the possibilities of radium treatment. Most of us think of radium in connection with malignant diseases, but few of us use it in tuberculosis of the conjunctiva and lacrimal passages, in obstinate cases of trachoma, or merely for its analgesic effect in nonoperable cases of malignant disease. The authors state in their preface that their aim in compiling this material is to provide a practical guide for the ophthalmologist, who in seeking this information in the literature is apt to be confused by inaccurate reports and contradictory statements.

The book is remarkably free from broad assertions unsupported by scientific proof, and the authors do not hesitate to question the accuracy of observation of many authors whose statements they quote. For instance, in mentioning Koster's report on improvement of progressive myopia after the application of radium they bluntly say that such unrestrained optimism tends to bring radium therapy into disrepute. Their own regard for scientific accuracy, the minuteness of detail in the instructions in the chapter on technique, and their extreme caution in arriving at conclusions in their clinical reports make the book a delight to the scientist, and inspire confidence in the authors' judgment.

The high price of radium prohibits its inclusion in the equipment of every ophthalmologist. But the ophthalmologist should have a clear understanding of the possibilities of radium therapy, its indications, and its limitations, in order to use intelligently the services of the radiologist. One wishing such information will welcome this book as well worth owning and referring to in many cases where we feel the need of enlarging our therapeutic armamentarium. *Ray K. Daily.*

Report of eye clinics, hospital of graduate school of medicine, University of Pennsylvania, 1928-29. By Professor L. Webster Fox. Paper, octavo, 90 pages. Philadelphia, July, 1929.

This is the fourth volume of this series of clinical experiences. The 348 notes of cases it contains will furnish something of interest to any one thinking much about clinical ophthalmology. Most of the notes refer to operative cases; but some are follow-up notes on operative cases previously described, and some are of cases needing no operative treatment.

Aside from the important features of the cases shown, much general information has been brought together regarding trachoma, glaucoma, and diabetes. The general history of trachoma and its epidemic spread, particularly in America, has been taken up. The early accounts of the diseases of the Indians seem to indicate that trachoma was originally unknown among them, or rare or unimportant. The problem now is to eradicate the disease. The surgical treatment is satisfactory. "The patient receiving surgical treatment, at the very worst, has more periods of relief than those otherwise treated. Also the degree of relief is greater." "But care

must be exercised in the choice and combination of procedures in the individual case, in order not to discredit the surgery of the condition as a whole."

As to glaucoma, the pathologic anatomy on which operative treatment is based points to the operation chosen to combat it. Cases are given, and the methods of doing five of these operations, besides enucleation, the final resort for relief from pain. Iridectomy was done in 9 cases, anterior sclerotomy in 5, Herbert's operation in 1, and enucleation in 6. No case of trephining is reported. This shows the wide difference in glaucoma and its treatment in America, from what is reported in Egypt and India.

Among 254 cases of diabetes examined in the graduate hospital, 19 were found to have cataract. But none of these is given as having come to operation. In one case of cataract in a diabetic, extraction was done, and the eye recovered. The amount of blood sugar in cases that can be operated on is set considerably higher than formerly; and under insulin treatment any case of hyperglycemia can be quickly reduced to the operative level.

Much of this report is given to the description of operative technique. It is pleasant to learn that in the writer's experience simplicity has been attended by satisfactory results. Points of differential diagnosis also come out, and practical suggestions as to management of patients. This whole series of case reports gives rather a close view of a large number of interesting cases, as they were seen by the writer and by those who assisted in his work. They come near to actual clinical experience in association with one who has had a long career, and who has given his best thought to his surgical practice and dealing with his patients.

Edward Jackson.

CORRESPONDENCE

Is optometry a profession?

To the editor:

Permit me, as a subscriber and a professional optometrist, to answer your objection to optometry, in the September journal (page 764).

I thoroughly agree with you that there are a great many optometrists that do try to "drum up trade", and do advertise, but that is not proof that the whole profession are unethical.

I take this stand because I am associated with an M.D. and a dentist, who are among the best in this city. I do feel that the ophthalmologist and optometrist can work very well together; and time for this is approaching very quickly.

We have raised our scholastic standards, and the boards of examiners are becoming more rigid each year.

Look at the position dentistry was in some years ago. We can not change things in a short while, but as soon as some of the old timers pass on and the younger element takes hold we shall take our place in the sun.

This joint committee should be appointed to meet with an optometric committee and an understanding brought about. We are a professional people actuated by a professional spirit.

Professionally yours,

Adolph Reader, Opt. D.

Bakersfield, California.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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6. CORNEA AND SCLERA

Fischer, F. **Concerning the permeability of the cornea and vital staining of the anterior portion of the globe, with remarks concerning the effect of vital stains on the choroidal plexus.** Arch. f. Augenh., 1929, v. 100-101, July, p. 480.

In a detailed and excellent paper, Fischer describes his method of determining the permeability of the cornea to vital Fischer stains. The results of intravenous injection of vital stains in albinotic rabbits were examined in frozen sections. The epithelium of the ciliary body contains oxygen, because it does not change methylin blue to leucomethylenblue, but the iris has a high reduction ability and changes alizarin blue to alizarin white. Acid stains that permeate the cornea have the ability when injected intravenously to color the iris but not the ciliary epithelium. Stains that do not permeate the cornea also do not enter the anterior chamber when injected intravenously. Fuchsin S. light green and marine blue when acidified, enter the aqueous through the cornea, after intravenous injection of small amounts they do not appear in the aqueous, do not stain the iris vessels, but do stain the ciliary epithelium. All stains that permeate the aqueous through the cornea enter the cerebrospinal fluid upon intravenous injection. But they do not stain the epithelium of the choroidal plexus. The stains that upon intravenous injection do not enter the cornea do not enter the cerebrospinal fluid but do stain the epithelium of the plexus although not the blood vessel walls.

The varying behavior of the stains is not dependent upon their chemical constitution but upon their colloidal quality. *Frederick C. Cordes.*

Fleischer, B. **The etiology of keratoconus.** Arch. f. Augenh., 1929, v. 100-101, July, p. 247.

The etiology of keratoconus is not limited to any single factor. Keratoconus can be the result of very different causes, local or general, and it develops because the center of the cornea is the weakest place and this can become ectatic through different causes. Hereditary factors also have to be considered. Astigmatism, particularly of an oblique axis, must be regarded as potential keratoconus. Before the problem can be solved, a better understanding of corneal metabolism will be necessary.
Frederick C. Cordes.

Gilbert, W. **Xanthoma of the cornea and sclera.** Arch. f. Augenh., 1929, v. 100-101, July, p. 329.

Gilbert reports a case of xanthoma of the cornea and sclera. In these cases a differential diagnosis must be made between hyaline degeneration and xan-

thoma. In the hyaline type, one finds evidence of previous trachoma, while in the xanthoma there is a definite increase in the cholesterin content of the blood.

Frederick C. Cordes.

Löhlein, W. **Migratory pigment cells in the epithelial layer of the cornea.** Arch. f. Augenh., 1929, v. 100-101, July, p. 385.

Löhlein, after his experiments, feels that the defect in the epithelium has a definite bearing on the migration of pigment cells to the cornea. The pigmentation of the limbus epithelium probably is influenced by the mechanical action of the eyelids. Further work is to be done on this subject.

Frederick C. Cordes.

Panico, E. **Contribution to the study of experimental tuberculosis of the sclera.** Ann. di Ottal., 1929. v. 57. March, p. 225.

The experiments were made by introducing human tubercle bacilli under the conjunctiva, on the sclera and into the scleral substance of rabbits. In each case in which the living or dead bacilli were introduced into or on the scleral tissues a large adherent nodule was formed. The overlying conjunctiva became adherent to the tumefaction, and ulceration was followed by caseous degeneration.

The conclusions reached are:

1. Primary tuberculosis of the sclerotic follows a benign course in regard to the ocular membranes in that such as are involved in the inflammatory processes require but a short time for their clinical recovery.
2. The infected nodule on the sclerotic develops caseous degeneration and healing is followed by the formation of a cicatrix.
3. Koch bacilli are always present in the affected scleral tissue, chiefly at the point of inoculation but later involving all of the inflammatory structures.
4. Following introduction of the living bacilli there is always present cervical and thoracic adenopathy.

Park Lewis.

Thiel, R. **Graphic registration of pulsation of the cornea.** Klin. Woch., 1929, v. 8, April 16, pp. 738-740.

The author describes an accurate method of registering the pulsations. The principle of the instrument is of two metallic rings, one of which rests on the limbus and the other is moveable on the apex of the cornea. This second ring is attached to a marker, and the graphic registrations are made at the same time that a sphygmographic record is being made of the carotid pulse and variations in breathing.

In the normal eye the volume of the pulse curve is well formed and compares with the carotid pulse. Closure of the central retinal veins does not affect the curve, which proves that the vessels of the uveal tract are essential in the production of the intraocular pressure. Increase of the intraocular pressure changes the amplitude of the corneal pulse and finally causes it to vanish. A second instrument estimates the modification of the corneal pulse pressure.

Beulah Cushman.

Weve, H. **The therapy of luetic interstitial keratitis.** Arch. f. Augenh., 1929, v. 100-101, July, p. 833.

Weve reports the results in the treatment of twenty cases of interstitial keratitis. Very early intensive treatment has a decided effect on the course and result of the condition. In three cases treatment was instituted early and in these the entire course of the disease was only six weeks. In three other cases treatment was started at the very beginning of symptoms, and these cases were clinically aborted. From his small series, Weve feels that early intensive antiluetic treatment has a beneficial effect on the course and severity of the disease.

Frederick C. Cordes.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Braun, G. **The treatment of experimental tuberculosis of the iris by ultraviolet light.** Arch. f. Augenh., 1929, v. 100-101, July, p. 782.

Braun produced tuberculosis of the iris in rabbits and then used ultra-

violet light as therapy. The light had no particularly beneficial effect on the condition. In a few instances the process was temporarily arrested but after a short interval became decidedly worse. But Braun feels that more work is necessary before the method should be condemned. *Frederick C. Cordes.*

Calderaro. **On the possibility of cure of sympathetic ophthalmia without enucleation of the traumatized eye.** Ann. di Ottal., 1929, v. 57, March, p. 194.

The author had reported previous cases in which a foreign body had been embedded in the posterior portion of the eyeball for long periods of time without sympathetic disturbances affecting the other eye. The condition was quite otherwise when the ciliary region was involved with either open or closed prolapse of the uvea.

In the prodromal stages of sympathetic irritation early enucleation is almost successful in avoiding invasion of the fellow eye, but in the graver form of iridocyclitis with total synechia, plastic fibrous exudate, lowered ocular tension, etc. it is admitted that enucleation is of little value. The conclusion of the author is that, in an eye with uveal prolapse which still possesses useful sight and which the patient is unwilling to sacrifice, early removal of the invaginated tissue whether open or closed, with cauterization of the wound, coaptation of the scleral margins with a fine suture, and restoration of the conjunctival covering will often prevent development of pernicious cyclitis with secondary involvement of the fellow eye. *Park Lewis.*

Franceschetti, A., and Hallauer, C. **Presence of antibodies in the intraocular fluids and cerebrospinal fluid, and influence upon them of theophyllin.** Arch f. Augenh., 1929, v. 100-101, July, p. 59.

The breaking down of the barrier between the blood and intraocular fluids by diuretics in rabbits results as we should expect in an increase in antibodies from the blood in both aqueous and vitreous. Especially noticeable was the fact that certain antibodies ordinarily not found were present in the animals thus treated (precipitin in the aqueous and hemolytic amboceptor in the vitreous). An increase of immunity bodies in the cerebrospinal fluid after theophyllin was not demonstrable. *Frederick C. Cordes.*

Fuchs, Adalbert. **Polynuclear plasma cells and the occurrence of Russel bodies.** Zeit. f. Augenh., 1929, v. 68 June,, p. 134.

Three cases are described in detail in which large numbers of atypical plasma cells were found in great numbers. They had typical plasma cell cytoplasm, but were larger, though variable in size, and had two or more, often unequal nuclei. Mitoses were very frequent.

In almost all chronic inflammations of the iris in which lymphocytes and plasma cells compose the infiltration, Russel fuchsinophile bodies are found. Often they lie free in the tissue, and occasionally one still finds them in the deformed cell in which they have arisen. Russel described them as the cause of carcinoma but now the view is probably generally accepted that they are products of plasma cells. Fuchs describes one case in which the intracellular form occurred in great masses, but strangely there were very few typical plasma cells in these sections. In explanation Fuchs assumes that in the transformation of lymphocytes into plasma cells the latter degenerated so fast that their protoplasm became homogeneous and eosinophilic immediately.

In another case he found in serial sections an area thickly studded with Russel bodies without protoplasmal covering, and yet there was no particular increase of lymphocytes or plasma cells near it. Why it occurred he can not say, though he believes the explanation must be sought in a peculiarity of the tissue in which it occurred rather than of the inflammatory process. *F. H. Haessler.*

Hallauer, C., and Franceschetti, A. **Increase of antibodies in the aqueous.**

Arch. f. Augenh., 1929, v. 100-101, July, p. 81.

The permeability of the barrier between the blood and aqueous for homologous agglutinations is greater in rabbits when fractional serum is introduced into the circulation than when whole serum is used. This applies to both euglobulin and pseudoglobulin.

Frederick C. Cordes.

Marchesani, O. **Sympathetic ophthalmia in the light of experimental evidence.** Arch. f. Augenh., 1929, v. 100-101, July, p. 606.

Marchesani reviews the experimental work that has been done on sympathetic ophthalmia. In animal experimentation, the production of sympathetic ophthalmia seems to be the result of toxin, or can be produced by toxins. Marchesani feels that it is hardly conceivable that sympathetic ophthalmia in man is possible without bacteria.

Frederick C. Cordes.

Liebitzky, H. **Congenital iris anomaly.** Arch. f. Augenh., 1929, v. 100-101, July, p. 761.

Liebitzky reports two cases of identical anomaly of the iris. In each case the pupils were pear shaped. This irides were blue gray in color. The central third of the iris in these cases was decidedly thinner and was sharply demarcated from the remainder of the iris by a sharp ridge. In addition, there was absence of iris sphincter.

Frederick C. Cordes.

Müller, H., and Pflimlin, R. **The influence of the sympathetic upon the albumin content of the aqueous.** Arch. f. Augenh., 1929, v. 100-101, July, p. 91.

The albumin content of the aqueous in ninety-two normal rabbits' eyes was found by the authors to be 0.044 per cent. There was of course some variation, and in some of the animals the content was considerably higher. There was also a variation between the right and left eye from the same normal animal. Resection of the cervical sympathetic nerve under ether anesthesia produced a decided increase in the albumin content of the aqueous. Where this was done without anesthesia it did not produce an albumin increase in all of the animals. Forty minute stimulation with faradic current produced no changes. The increase of albumin content in the second puncture was little influenced by severance of the sympathetic. The usual increase due to puncture is diminished by faradic stimulation. *Frederick C. Cordes.*

Yoshida, Y. **The interchange between blood and aqueous.** Arch. f. Augenh., 1929, v. 100-101, July, p. 470.

Yoshida found that the fluorescein content of the aqueous was dependent on that of the blood. The second aqueous, after an hour, had the same percentage as the serum and the serum filtrate had the same fluorescein content as the aqueous.

Frederick C. Cordes.

8. GLAUCOMA AND OCULAR TENSION

De Decker, J. F. **The influence of an increase in plasma upon normal intraocular tension.** Arch. f. Augenh., 1929, v. 100-101, July, p. 180.

De Decker found that changes in the plasma caused by forcing fluids and by intravenous injection of salt solution did not influence intraocular tension. In spite of marked increase of blood plasma light and heat produce a slight drop in intraocular tension whereas simultaneously the blood pressure is made to drop twenty to fifty millimeters. *Frederick C. Cordes.*

Duke-Elder, W. S., and Duke-Elder, P. M. **Some physicochemical factors influencing the intraocular pressure. Experiments on the "perfused" eye.** Brit. Jour. Ophth., 1929, v. 13, August, p. 385.

These investigators conclude from the result of their experiments on the surviving perfused eye, in which systemic influences are eliminated, that the intraocular pressure falls with increase in osmotic concentration of the crystalloids in the blood, and rises with decrease in their concentration; while the intraocular pressure falls with increase

in the osmotic concentration of colloids in the blood and rises with relative decrease in their concentration. Within the limits of the changes in the reaction of the blood which were used in these experiments the intraocular pressure falls with decrease in pH and rises with increase in pH. The mechanism of this change and the part it may play (if any) in the production of pathological changes in intraocular pressure is still a matter of dispute. Twelve pressure-tracing illustrations and twenty-two references accompany the contribution.

D. F. Harbridge.

Herbert, H. **On the cement substance of the intraocular muscles and chronic glaucoma.** Brit. Jour. Ophth., 1929, v. 13, June, p. 337, and July, p. 351.

This is an exhaustive study of the cement substance, its function, and its relation to chronic glaucoma. The first part is devoted to histologic study of the cement and associated tissues. The substance differs somewhat in quality from that of smooth muscle elsewhere in the body. This raises the question as to whether it should not be classed with the hyalin and glass substance of the eye. Selective staining emphasizes this. The second part discusses the anatomical basis for the origin of chronic glaucoma. There are two powerful arguments indicating that the seat of obstruction lies in the pectinate ligament in many chronic glaucomas. (1) Uribe Troncoso has recorded a case of glaucoma of some years' standing, with vision reduced to hand movements, in which the angle of the chamber was seen with the gonioscope to be entirely free. (2) Raeder has shown that the duration of the influence of eserin on intraocular tension in chronic glaucoma corresponds with the duration of its influence on the ciliary muscle, and not with that of its effect of the pupil.

If the site of obstruction lies in the pectinate ligament, there are only two available explanations of the mechanism of the obstruction, namely that given above and Thomson Henderson's theory of "sclerosis of the cribriform ligament", which lacks support. The degree of thickness varies greatly in different eyes. In some old people the lamellæ remain quite thin, and this may apply to glaucomatous eyes equally with others. Marked examples of thickening have certainly not always been in glaucomatous eyes. (Sixteen illustrations.) *D. F. Harbridge.*

Hertel, E. **The significance of Ehrlich's fluorescein experiments.** Arch. f. Augenh., 1929, v. 100-101, July, p. 460.

Hertel injected, intravenously, fluorescein in salt solution. Ehrlich's line appeared in a few moments but disappeared within two minutes and there was a marked drop in the intraocular tension. In control animals in which fluorescein alone was used Ehrlich's line remained for more than forty minutes. In another series the fluorescein injection was followed by intravenous gelatin. In forty minutes Ehrlich's line had completely disappeared, while it was still strongly positive in the control animal. These experiments again show that the osmotic pressure of the blood has a measurable effect in the movement of intraocular fluids.

Frederick C. Cordes.

Kleiber, G. **The regional application of calcium, magnesium, and strontium salt solutions to animal eyes.** Arch. f. Augenh., 1929, v. 100-101, July, p. 122.

Calcium salts and magnesium sulphate applied to the eye in drops or salve are well tolerated. Subconjunctival injection of calcium salt solution produces a marked conjunctivitis and local necrosis. Magnesium sulphate and strontium chloride can be injected without damage. The intraocular injection of calcium salt solution produces a severe intraocular reaction. Local application of calcium or strontium, or cataphoresis with a solution of calcium or magnesium sulphate, produces reduction of intraocular tension.

Frederick C. Cordes.

Magitot, A. **Glaucoma and the problem of its pathology.** Ann. d'Ocul., 1929, v. 166, July, pp. 565-579.

This is the third paper of a series on

this subject. In this the author states that glaucoma is due to an edema, as Terson had suggested in 1901, and that the important factor is the capillary wall. This possesses nerve fibers which have a trophic influence; that is, they control the metabolism of the cells and thus regulate their permeability.

Lawrence Post.

Schmidt, K. **Clinical and experimental studies of local and general circulatory changes in glaucoma simplex.** Arch. f. Augenh., 1929, v. 100-101, July, p. 190.

In careful clinical and experimental studies of the circulatory system in glaucoma simplex, Schmidt found that in all patients there was pathological decrease in fluid output. The influence of miotics, he feels, is primarily due to their effect on the blood vessels. If with conservative therapy, wth miotics, the tension remains up, it can be taken as an indication that the influence of miotics on the circulatory system is not sufficient to control the pressure.

Frederick C. Cordes.

Vom Hofe, K. **Clinical glaucomatous cupping without increased tension.** Arch. f. Augenh., 1929, v. 100-101, July, p. 414.

Vom Hofe reports four cases of glaucomatous excavation with normal tension. Of these, two later showed definite increase in tension. It is possible that these cases show increased tension only intermittently and that there may be longer periods of normal tension. These patients should be observed and, if changes take place, should have treatment in spite of normal tension.

Frederick C. Cordes.

Werner, Sigurd. **A study of hereditary juvenile glaucoma.** Acta Ophth., 1929, v. 7, pts. 1 and 2, p. 162.

The author reports the history of a family in which the mother and the three oldest of six living children were affected with the disease. Of the eight eyes, six were operated upon; three had iridectomies, two were trephined, and one had an iridencleisis; with the exception of one trephined eye, the results were unsatisfactory. A study of the family tree seems to indicate transmission of the disease through the dominant element. *Ray K. Daily.*

9. CRYSTALLINE LENS

Elschnig, A. **The zonular lamella.** Arch. f. Augenh., 1929, v. 100-101, July, p. 760.

Elschnig presents further evidence to substantiate his belief that the surface layer of the lens capsule in which one can see zonular fibers enter is the so-called zonular lamella.

Frederick C. Cordes.

Horven, Evind. **126 cataract extractions with the Stanculeanu-Török technique.** Acta Ophth., 1929, v. 7, pts. 1 and 2, p. 169.

In seventy-eight cases the lenses were extracted in the capsule, in thirty-two the capsule ruptured, and in sixteen it could not be grasped. In nine cases there was loss of vitreous. The author concludes that the method works best in immature cataracts, and is not satisfactory in the hypermature types. He is most impressed with the complete absence of postoperative reactions.

Ray K. Daily.

10. RETINA AND VITREOUS

De Decker, J. **The relation of the capillary changes to detachment of the retina.** Arch. f. Augenh., 1929, v. 100-101, July, p. 223.

De Decker found that in twenty-five percent of the cases of detachment of the retina of unknown etiology capillary changes were present. This can be shown locally in the eye with the detachment by observation during the alteration of body fluid content. During the period of blood plasma increase, there is a consistent increase of the intraocular tension of the pathological eye. *Frederick C. Cordes.*

Greeff, R. **Concerning the etiology of detachment of the retina.** Arch. f. Augenh., 1929, v. 100-101, July, p. 116.

Greeff discusses the various causes of

detachment of the retina. He cites several cases from which he concludes that acute gout must be included as possible etiological factors in spontaneous detachment of the retina.

Frederick C. Cordes.

W. Hemmes. **Hippel's disease.** Doctorate thesis, Groningen, 1929.

Hemmes treated in the neurologic clinic in December, 1928, a patient who belonged to a family in which Hippel's disease and brain tumors have often appeared. Tresling in 1922 and Rochat in 1927 reported concerning this family.

The mother died years ago in hospital with a brain process. Two brothers had been in the neurological clinic. The first, suffering with fits, had a brain tumor; he is alive but blind from atrophy after choked discs. The other had Hippel's disease diagnosed nine years before he came to the clinic for steadily increasing headache. A brain tumor was found, inoperable; a few months later he succumbed after pneumonia.

Hippel's disease was diagnosed in Hemmes' patient in 1919; he had become slowly blind in one eye, the other eye had diminished vision. The attacks of headache became more violent, with vomiting and dizziness. His gait was affected. He was admitted in a very deplorable condition and the diagnosis of brain tumor made. Surgical intervention was unsuccessful, the patient dying a few weeks later.

The son of a sister of this patient showed Hippel's disease in 1927 in both eyes, and one eye has already been enucleated; this boy does not show cerebral affection.

We find therefore in this family in three sucessive generations, in five patients, four times a brain tumor and three times Hippel's disease. The author gives a survey of the literature; a chapter is devoted to angiomata of the central nervous system, and a description follows of the cases in the Groningen clinics.

The disease as originally described by Hippel is not an affection of the eye alone. The same change, namely angioma formation, is also found in cerebellum and medulla and often combined with angioma retinæ. It is therefore better to speak with Lindau of angiomatosis of the central nervous system. About fifty cases of this rare condition are known. The disease begins mostly before the thirtieth year and is progressive. Familial disposition is found.

The therapeutical results are small. Retinal angioma can only be treated by enucleation. Angioma cerebelli produces increased cranial pressure through formation of cysts and consecutive hydrocephalus. This necessitates trepanation. Recently Cushing and Dandy have removed the angioma through the opening in the cranium; the symptoms of increased brain pressure did not recur and the patients were able to return to work. *E. E. Blaauw.*

Holm. Ejler. **Demonstration of vitamin A in retinal tissue, and comparison with the vitamin content of brain tissue.** Acta Ophth., 1929, v. 7, pts. 1 and 2, p. 146.

By feeding rats the retinas of calves, the author was able to relieve the xerophthalmic disturbances induced by an A-vitamin-free diet. The feeding of brain tissue did not have the same effect. From his studies the author concludes that the retina is richer in vitamin A than any other part of the mammalian body. Vitamin A is usually attached to lipoids, and these are found in greatest abundance in the outer segments of the rods in association with the visual purple. *Ray K. Daily.*

Keesch, K. **The anatomy of the vitreous.** Arch. f. Augenh., 1929, v. 100-101, July, p. 680.

In a long article that does not lend itself to abstracting, Keesch discusses the anatomy of the vitreous. He also describes his method of ultramicroscopic study. *Frederick C. Cordes.*

Kyrieleis, W. **"Albuminuric retinitis" without ophthalmoscopic findings.** Arch. f. Augenh., 1929, v. 100-101, July, p. 861.

Kyrieleis reports a case of marked nephritis and arteriosclerosis. Two days

before death, the fundi showed only a marked retinal arteriosclerosis. Histological examination of the eye showed, in addition to the arteriosclerosis, a diffuse fatty infiltration of the retina. In some areas there was degeneration of the intercellular layer. In only a few places the pigment epithelium showed cell proliferation and fat particles in the cells.

Frederick C. Cordes.

Riehm, W. **Acute pigmentary degeneration of the retina following the use of an iodin preparation.** Arch. f. Augenh., 1929, v. 100-101, July, p. 872.

Riehm has previously reported three cases of women who, because of puerperal sepsis, had received "septoiod." (Septoiod is an iodin preparation that contains 0.03 to 0.04 percent free iodin, derived from sodium iodide and sodium hypoiodide). These cases developed pigmentary degeneration of the retina. Riehm gave toxic doses of "septoiod" to eighteen rabbits. In all of them pigmentary degeneration of the retina developed. Aside from this degeneration, no other changes were found in rabbits and none have been reported in humans.

Thus, "Septoiod" is very well tolerated by cell structures except the retina, while in the retina a small dose sometimes produces permanent changes. *Frederick C. Cordes.*

Rosenbau, J. M.D. **Coloboma of the optic nerve with remains of the hyaloid artery.** Brit. Jour. Ophth., 1929, v. 13, August, p. 407.

A female aged thirty-two years with defective vision presented in the right fundus increase of the surface of the optic disc to about twice the normal size, and the site of the disc was occupied by a greyish-white funnel-shaped cavity. The temporal margin of the funnel showed masses of black pigment, while at the nasal margin there were one or two specks of pigment. From about the middle of the nasal side of the funnel the remains of a hyaloid artery floated in the vitreous in the form of a connective tissue tag. (One illustration.) *D. F. Harbridge.*

Saba, V. **On postmalarial ocular changes simulating pernicious anemia.** Ann. di Ottal., 1929, v. 57, March, p. 213.

Fourteen cases are reported. The author's observations lead him to the conclusion that ocular symptoms are frequently present, some being such as are found in pernicious anemia and others in malaria. Among the symptoms noted are:

1. A uniform pallor of the ocular fundus, more or less marked, depending on the degree of anemia.
2. Pallor and veiled appearance of the papilla.
3. Retinal edema, in light cases merely bordering the disc, in more advanced ones being diffused throughout the retina and giving it a milky aspect.
4. Turgescence and dilatation of the veins with narrowing of the arteries.
5. Hemorrhage exceptionally absent, but found in thirteen of the fourteen cases, having no specific characteristics as to form, location, or extent.

Park Lewis.

Schmelzer, H. **Familial detachment of the retina.** Arch. f. Augenh., 1929, v. 100-101, July, p. 268.

Schmelzer reports the cases of three young myopic adults between the ages of eighteen and twenty-five years, out of a family of five who had unilateral detachment of the retina with chorioretinal pigment disturbances in the periphery of the fundus. These pigment changes were also noted in the father and another member of the family. Schmelzer feels that the pigment changes together with the myopia were probably the basis of the detachment.

Frederick C. Cordes.

Seefelder, R. **Pathological anatomy of circinate retinitis with a consideration of the origin of the so-called fat-granule cells.** Arch. f. Augenh., 1929, v. 100-101, July, p. 334.

The pathological picture of circinate retinitis is a massive collection of fat granule cells between the inner and outer nuclear layers. Seefelder agrees with Leber that these cells are derived

from the pigment epithelium. The possible origin of the fat granules is also discussed. *Frederick C. Cordes.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Beckert, L. **Hereditary optic atrophy (Leber's disease) in women.** Arch. f. Augenh., 1929, v. 100-101, July, p. 285.

Beckert reviews the literature on Leber's disease and finds that in women the disease frequently makes its appearance after the age of thirty-five years. It was found that forty-three percent of the children of women suffering from the disease also had the condition, while thirty-eight percent of the children of conductors showed evidence of the malady. *Frederick C. Cordes.*

Lohmann, W. **Inverted temporal conus.** Arch. f. Augenh., 1929, v. 100-101, July, p. 851.

Lohmann describes two cases in which he found an inverted temporal conus. The picture of temporal conus as we are accustomed to seeing it was found on the disc itself. The choroidal vessels could be seen to be present.

Frederick C. Cordes.

Passow, A. **Ophthalmological experiences with x-ray therapy of intracranial tumors (exclusive of pituitary tumors).** Arch. f. Augenh., 1929, v. 100-101, July, p. 564.

Passow observed seventy-two patients with brain tumor that received x-ray therapy. Of these, eighteen were children. Of the adults, eight showed apparent cure of the condition, six relief while under observation, eight temporary relief followed by progression of the symptoms. In three patients the eye pathology progressed, while in four cases trephining was done. In twenty-one cases the therapy was a complete failure. Of the eighteen children, three showed an apparent cure, five received temporary relief, four showed no improvement but the therapy gave a definite prolongation of life. In six patients, no improvement or cessation of the condition was noted.

Frederick C. Cordes.

12. VISUAL TRACTS AND CENTERS

Zeeman, W. P. **Fixation and optical ocular movement.** Arch. f. Augenh., 1929, v. 100-101, July, p. 1.

Zeeman states that it is supposed that there are anatomically similar pathways for sequence and fixation and that only the source of impulse and the associated communications are different. The disturbances in sequence and fixation, of a pathological nature, probably have their origin in another source.

Frederick C. Cordes.

13. EYEBALL AND ORBIT

Knapp, A. **Technique of the Krönlein operation.** Arch. f. Augenh., 1929, v. 100-101, July, p. 754.

Arnold Knapp discusses the indications and technique of the Krönlein operation. In his work he has found extremely valuable the use of a Hartley-Kenyon hand motor (electric) equipped with a small circular saw. The equipment is described in detail.

Frederick C. Cordes.

Laricchia, F. **Endorbital microgumma.** Ann. di Ottal., 1929, v. 57, March, p. 198.

The development of a tertiary syphilitic neoplasm within the orbit often presents diagnostic difficulties which only biopsy can solve. In a young girl an elastic swelling of the left upper lid had been increasing for about four months, with redness and difficulty in elevating the lid. More recently there had been noticeable proptosis; no pain had ben present at any time; at the time of the examination complete ptosis of the left upper lid. The palpebral skin was hyperemic and dark in color, movements of the globe limited especially upward, negative Wassermann.

An incision was made below at the superciliary region. In the depths of the orbit was found a fleshy neoplasm with whitish striæ and yellowish centers widely involving the tendons of the extrinsic ocular muscles. It was impossible to remove the deeper portions of the tumor, but a piece was secured. Histological examination showed in-

flammatory hyperplasia with small foci implanted in the sheaths of the muscles and extensions into the tendinous fascia at the apex of the orbit. These small masses were the so-called "microgummæ". They differ from common gumma in that because of their small size there is not complete necrobiotic degeneration and on absorption of the gummatous products the infiltrated structures pass into an organized formation of sclerotic tissues. Under antiluetic treatment, during which a second Wassermann gave a positive reaction, the condition grew better.

Park Lewis.

Scotti, Pietro, **A case of traumatic pulsating exophthalmos.** Ann. di Ottal., 1929, v. 57, March, p. 248.

A young man received a revolver shot in the left submental region. Ten days later he experienced puffing sounds in his left ear which became so intense on lying down as to prevent him from sleeping. He also heard whistling, hissing, and hammering sounds on the left side with rhythmic shocks in the left eyeball, which protruded between the lids so as to prevent their closure and became markedly reddened. Some days later the sight became affected, he was easily fatigued, and he had diplopia on looking at a distance. Six months later the proptosis continued, with slight strabismus, injection of the left eyeball, pupil dilated and reacting feebly to light and accommodation, dioptric media transparent, left vision 7/10 not improved by glass, marked limitation of the temporal fields for white and colors, nasal field almost normal, and reduction of mobility on looking toward the temporal side, due to paresis of the abducens. The radiograph demonstrated a foreign body in the left side of the nasopharyngeal part of the vena cava on the sphenoidal sinus. No bony fracture or splinter was shown.

In an accurate radiogram taken seven months later no evidence of the foreign body was found. It was concluded that the movement of the jaws had caused it to slip into the pharynx, whence it had passed away by the natural route.

Later a ligation of the carotid was followed by amelioration of the head noises, but other symptoms remained unchanged. The clinical diagnosis was of an aneurism caused by laceration of the carotid in the cavernous sinus. The author considers that the bullet in striking the sphenoid caused a sliver of the bone to penetrate the carotid itself, remaining in the soft parts and becoming eventually dislodged by the motion of the jaws. *Park Lewis.*

14. EYELIDS AND LACRIMAL APPARATUS

Arruga. **Bevelling hole in bone in operations for treatment of tearing.** Ann. d'Ocul., 1929, v. 166, July, pp. 580-594.

A modification of technique for dacryocystorhinostomy is described by the author. He makes the usual incision for extirpation. The sac is pushed to one side and a hole is trephined through the bone into the nose, using a six-millimeter trephine. The nasal mucosa and the posterior sac walls are incised, and a continuous mucous membrane canal is formed by suturing the cut edges of the sac and those of the mucosa together. Simplicity and efficacy are claimed. *Lawrence Post.*

Schöpfer, O. **Trophoneurotic stimulation of the growth of the cilia in neuroparalytic keratitis.** Klin. M. f. Augenh., 1929, v. 82, June pp. 776-778. (1 ill.)

Three cases of neuroparalytic keratitis with excessive length of the cilia are reported. One followed fracture of the base of the skull, with paralysis of the right abducens and of the sensory fibers of the right fifth nerve, and complete anesthesia of the cornea and conjunctiva, in a man aged forty-eight years. The second was in a boy aged seven years, with central opacity and complete anesthesia of the right cornea after injury of the orbit with a stick. The third was in a woman aged fifty years with superficial keratitis and iritis in tertiary lues. The center of the cornea was opaque, and the cornea anesthetic.

According to Behr neuroparalytic keratitis is due to irritation of trophic fibers of the sympathetic nerve which join the fifth nerve in the ciliary ganglion. The excessive growth of the cilia seems to be an expression of disturbed trophic regulation. *C. Zimmermann.*

Shastid, W. E. **Emphysema of the eyelids.** Illinois Med. Jour., 1929, v. 55, April, p. 277.

A three-year-old child fell on a lead pencil and punctured the apex of the left lung. Emphysema presented first in the eyelids. Both eyelids were entirely closed within five minutes, and the emphysema later became evident over the entire face and torso. Complete uneventful recovery followed in two weeks. *Ralph W. Danielson.*

Vannas, Marmo. **Modification of canthotomy.** Klin. M. f. Augenh., 1929, v. 83, July, pp. 89-91. (1 ill.).

The usual canthotomy has at first a good effect, which, however, does not last long. Vannas has devised the following modification. The lateral angle of the palpebral fissure is stretched between two fingers, and the lateral canthus is vertically incised with a sharp knife between conjunctiva and skin and the incision continued into the intermarginal regions of both lids. The incision is altogether eight millimeters long. After undermining the conjunctiva to the lateral retrotarsal fold, the upper lid is grasped with forceps or between thumb and index finger, and is stretched in an upward and nasal direction and the fascia and muscular fibers cut transversely with scissors. Finally conjunctiva and skin at the middle of the incision are sutured. The operation has the advantage that the conjunctiva is kept intact and the thread never cuts through, while it is easy, the cosmetic result good, and there is no danger of postoperative ectropion.
C. Zimmermann.

Weingott, L. A. **A new plastic operation for cicatricial ectropion.** Klin. Oczna, 1929, August, pp. 81-82.

This new plastic procedure is demonstrated on a case of extensive cicatricial ectropion of the lower eyelid. Two incisions are made: one parallel to the free border of the everted eyelid and directed toward the internal canthus, the other directed vertically along the nasal fold until it reaches the upper end of the first incision, and then continued about 1.5 cm. higher. Thus an inverted Y-shaped incision is formed. The triangular piece of skin is dissected, and its apex is attached to the highest point of the vertical incision.
M. Beigelman.

15. TUMORS

Gallemaerts and Gauthier. **Multiple cysts of iris.** Ann. d'Ocul., 1929, June, v. 166, pp. 436-439.

The case of a boy who had a single iris cyst removed at four years and who showed five cysts at seventeen years is described. These later cysts also were removed. Slit-lamp studies were made before operation. (Four colored illustrations.) *Lawrence Post.*

Grosz, E. **Sarcoma of the uveal tract.** Arch. f. Augenh., 1929, v. 100-101, July, p. 236.

Grosz reviews nineteen cases of sarcoma of the uveal tract, giving the history and a microphotograph of each case. He emphasizes the necessity of early diagnosis and recommends scleral puncture as an aid. His cases show that an eye can harbor a sarcoma and give no symptoms or signs of the condition. Local recurrence is found only in the third stage, when the sarcoma has perforated the sclera. The time of metastasis varies greatly. Liver metastases are most frequent and at times make themselves apparent many years later. The author's inquiry showed that in case of proved sarcoma the mortality was great (about fifty percent). This can be improved only by early diagnosis. *Frederick C. Cordes.*

Kiel, E. **A peculiar case of brain tumor penetrating into the orbit.** Klin. M. f. Augenh., 1929, v. 83, July, pp. 105-107. (1 ill.).

A woman aged fifty-two years had noticed for six years protrusion of her right eye. The fundus was normal but the visual field concentrically contracted, vision 3/10. The left eye showed papillitis. Roentgen examinations revealed a defect in the right upper orbital margin. After an incision parallel to the right eyebrow a melanotic intradural tumor was exposed which had destroyed almost the whole orbital roof. It extended into the orbit so far back that its removal could not be thought of, and it was treated with roentgen rays with good results. An excised piece revealed perithelial angiosarcoma.

C. Zimmermann.

Pfingst, A. O. **Sarcoma of lacrimal sac.** Internat. Jour. of Med. and Surg., 1929, v. 42, April, p. 198.

In June, 1923, a healthy eleven-year-old girl complained of a swelling over the region of the right tear sac. She had been operated on six months previously for a similar condition in this area. The mass was the size of a small hazelnut, the surface was smooth, and it felt fixed at the base and firm. Microscopic section of tissue again removed showed no positive evidence of malignancy. Again in August, 1925, the region was raised and discolored, but smooth. Three radium treatments a month apart reduced the area so that by March, 1926, the only symptom present was occlusion of the lacrimal duct, with evidence of slight edema. There was another similar recurrence in October, 1928, when removed tissue showed spindle-celled sarcoma. Prognosis was considered unfavorable. In 1925 Strada and Saralia found only twenty-five cases recorded. *Ralph W. Danielson.*

Poos, G. H. **Melanosarcoma of the choroid, report of a case.** Jour. Missouri State Med. Assoc., 1929, v. 26, July, p. 331.

Poos calls attention to the four stages, namely, retinal detachment, glaucoma, extension, and metastasis. The case reported is of a man aged sixty-five years, who appeared April 23, 1928, complaining of intense pain in the left eye and temporal region during the previous year. The eye had been blind for six months, having begun to be inflamed five years previously, six months after accidentally striking his head on the pavement. Examination revealed a proptosed, fixed, chemotic, hard, cataractous eye in which the fundus could not be seen, and which slightly transmitted light superiorly and inferiorly. The right eye was normal, the associated glands normal, but sinus involvement indicated by x-ray. April 30, 1928, complete exenteration revealed invasion of the sinuses. One week later radium was applied. On November twenty-fourth recurrence was discovered. Up to the time of writing the paper, April 12, 1929, the patient had needed radiotherapy every three weeks to control cephalalgia. The pathological report by Lamb was melanosarcoma with a small amount of neoplasm within the eyeball and a large amount externally, extensive splitting of the sclera, and hemosiderin granules within the tumor cells. (Bibliography.)

Ralph W. Danielson.

Schappert-Kimmyser, J. **The frequency of uveal melanoma in eyes with and without sarcoma.** Arch. f. Augenh., 1929, v. 100-101, July, p. 46.

There is no apparent direct relation between melanoma and sarcoma of the uveal tract. The eye predisposes to melanoma as much as it does to sarcoma. Melanoma have been observed over long periods of time with no appreciable changes. All eyes enucleated for sarcoma should be carefully studied as to the possible presence of melanoma.

Frederick C. Cordes.

Schappert-Kimmyser, J. and Mulock Houwer, A. **Melanoma and "smallest" sarcoma.** Arch. f. Augenh., 1929, v. 100-101, July, p. 21.

The authors describe tumors of the choroid, in an eye containing a sarcoma of the iris, which anatomically and clinically resemble melanoma, nevus pigmentation, and "smallest" sarcoma.

In a careful survey of so-called smallest sarcomata they feel the diag-

nosis of sarcoma is not established. Cell division is not consistent; the cell type is typical and growth by infiltration has not been established. These belong rather to the melanoma group and can be compared to skin nevus. There is a marked similarity between "blue nevus" of the skin and melanoma of the choroid. The authors suggest the name melanophakos for this group of tumors. *Frederick C. Cordes.*

Weber, F. P. **A white "nevus" of the ocular conjunctiva in a child.** Brit. Jour. Children's Dis., 1928, v. 25, Dec., p. 276.

Weber reports the case of a three-year-old healthy-looking English girl who was admitted to the hospital for observation in regard to so-called "jactatio capitis nocturna". On the lower part of the limbus of the right eye was a slightly raised, opaque, whitish, circular spot about three millimeters in diameter which had been present since birth. By ordinary examination without a lens its surface was shiny and there was no evidence of any inflammation, it being apparently covered by intact epithelium. With a lens a fine network of capillary blood vessels was found on the surface. Ophthalmoscopic and other findings were normal. The child had had a supernumerary auricle and a nevus on the scalp removed previously. The author suggests that the mass might be of the nature of a fibroma, and he cites one case of fibroma of the sclera removed from an eighteen-year-old girl. *Ralph W. Danielson.*

16. INJURIES

Flecker, H. **Skiagrams of the eyeball.** Med. Jour. Australia, 1929, v. 2, July 27, p. 123.

The shadow of the eyeball, in skiagrams of the head, has frequently been noticed by Flecker. An accompanying illustration, showing the contours of both eyeballs, reproduces the skiagram made from a girl of fifteen years, and could not be due to calcareous changes of advancing years. He has seen similar contours in considerably younger children. Such a skiagram might be of importance in determining if a foreign body were within or outside the eyeball. It brings to mind the method of making roentgenograms advocated by Vogt, to show the relations of small foreign bodies to the soft tissues in and around the eyeball. *Edward Jackson.*

Jacqueau. **The giant magnet and metallic intraocular foreign bodies.** Bull. Soc. d'Opht. de Lyon, 1927-28, v. 16, p. 17.

In reporting a case of removal of an intraocular metallic foreign body, the author comments on the superiority of the giant magnet in such cases when compared with the numerous types of smaller magnets. If one uses the latter when the foreign body is located deep in the globe, one must insert the tip into the vitreous in order to extract the metal and serious results are probable. *J. B. Thomas.*

Nechitch, G. **Electromagnets.** Ann. d'Ocul., 1929, v. 166, July, pp.. 513-565.

This is an extensive treatise on electromagnets including history, discussion of the relative power of various types, and description of the author's magnet and of his method of extraction of intraocular foreign bodies. He prefers a giant magnet, using the anterior chamber route. This is followed by incision into the chamber and magnet extraction, the point being attached by a 25 cm. chain to the giant magnet, thus reducing the magnetic power and rendering simple the manipulation of the magnet point. The application to the removal of foreign bodies from the muscles in other parts of the body is also discussed. *Lawrence Post.*

Rötth, A. **Indications for early plastic work in burns of the eyeball (Denig's operation).** Klin. M. f. Augenh., 1929, v. 82, May, pp. 669-672.

According to Rötth early transplantation of mucous membrane of the mouth after burns of the eyeball is indicated if a large part of the conjunctiva is necrotic. If, however, there is suspicion of necrosis of the superficial layer of the sclera, transplantation does not promise much. The operation is indicated if the

cornea is devoid of epithelium and anesthetic or shows a primary deep opacity. In four years the author observed seventy cases of burn and corrosion of the eye, out of which fifty-one were produced by lime or sodium hydroxide. In seventeen the conjunctiva alone was affected, in thirty-four also the cornea, presenting diffuse opacities, partly devoid of epithelium. In only five did the vision remain impaired. If transplantation had been done to all these cases of corneal participation it would have been done unnecessarily in twenty-nine.

C. Zimmermann.

Terson A. **Utilization of muscular insertions for radiographic localization.** Ann. d'Ocul., 1929, June, v. 166, pp. 468-470.

For x-ray localization of a foreign body the author utilizes the known insertions of the four recti in relation to opaque lead plates introduced into the conjunctival sac and marked with the millimeter rule. *Lawrence Post.*

Vogt. A. **Glassblowers' cataract at the Buelach glass works with observations on detachment of the anterior lamellæ of the lens capsule.** Schweiz. med. Woch., 1929, v. 59, May 4, p. 475.

The experimental and clinical evidence for the author's well known opinion that the exclusive causative factor in glassblowers' as well as smelters' and blacksmiths' cataract is the infra red rays is reviewed. He points out that experimentally only the short-waved infrared rays, those between 800 and 2,000 micromillimeters, have produced cataract, that this has been accomplished without injury to the cornea, thus ruling out the agency of heat rays, and that clinically the eye nearest the incandescent mass is the first to be affected. Specific sensitiveness of the lens to infrared radiation is assumed. The slit-lamp has shown that, in addition to the axial lens opacities characteristic of infrared cataract, there is an annular, complete or partial detachment of the anterior lamellæ of the anterior lens capsule. This begins axially from the zonule, at the line of cleavage where the break in the capsule in subluxation has also been shown to occur, and extends to the pupillary zone, where it remains attached. The rolling forward of the detached membrane into the anterior chamber, with the attached pupillary capsule, forms the characteristic more or less cup-shaped cuticle. This cuticle is only found in persons over forty years, and age must be a factor in its formation. The same process is involved in the production of capsulocuticular glaucoma, except that here the cuticle is fragile and crumbles, while in glassblowers' cataract it has retained its elasticity. Blue-green (ferrous oxide) goggles are advocated as a protection for the Buelach workers who manufacture green bottle glass, on the principle that absorption equals emission.

M. Davidson.

17. SYSTEMIC DISEASE, INCLUDING PARASITES

Adamantiadés. **Hydatid cyst of the orbit, perforating cyst of the orbit with expulsion of the cyst through the nostril.** Arch. d'Opht. 1929, v. 46, June, p. 368.

A girl aged eleven years entered the hospital in February, 1929, with exophthalmos of the right eye. In May, 1926, there was a slight injury with swelling of the lids. After this there remained exophthalmos of one centimeter, and there was a slight keratitis The disc appeared pale and edematous. Vision was 6/10. The diagnosis was a tumor of the internal portion of the orbit in the region of the optic nerve. Exploratory operation found no tumor, but a small quantity of yellow pus was evacuated. A perforation from the infection, in the angle of the orbit toward the posterior portion of the nasal cavity, was discovered with a probe. The day after operation there was periorbital swelling and fever. Anaphylaxis from the hydatid cyst was considered and a blood count showed five percent of eosinophilia. Two days later a small piece of membrane was found in the pus. A week after operation a large membrane was blown from the right nostril: it contained a little pus. Hooklets were found in these membranes.

The complement fixation for hydatid disease gave negative results on two occasions. There was no pain in the early stages, as is classically described. Some of the literature on similar cases is reviewed. *M. F. Weymann.*

Awguschewitsch, P. L. **Elephantiasis of the left upper eyelid, hemihypertrophy of the face, and hydrophthalmus with simultaneous enlargement of the sella turcica.** Klin. M. f. Augenh., 1929, v. 83, July, pp. 91-96. (1 ill.)

A woman aged nineteen years had been born as a healthy child. One year after birth the mother had noticed a thickening of the skin of the left foot, followed at the age of three years by hypertrophy of the left side of the face and of the left upper lid. Then the left eye gradually grew larger and in her seventh year became totally blind. It showed hydrophthalmus, opaque cornea, deep anterior chamber, atrophic iris, tension plus two, negative Wassermann reaction. Excised pieces of the skin of the upper lid revealed elephantiasis. The unilateral localization of the hypertrophy, the congenital character of the process, and the formation of strands in the skin justified the diagnosis of neurofibroma. Roentgen examination disclosed thickening of the walls and enlargement of the sella turcica, and four intense shadows at its base, which might be regarded as calcified foci in the hypophysis.

C. Zimmermann.

Heine, L. **The intraocular indications for interruption of pregnancy and for sterilization.** Arch. f. Augenh., 1929, v. 100-101, July, p. 439.

An absolute indication for interruption of pregnancy and for sterilization is present where a patient has had several pregnancies with retinitis and some permanent impairment of vision. Heine felt justified in this procedure in a case of high myopia associated with glaucoma, and again in a patient with marked iridocyclitis and disseminated choroiditis. Keratoconus, keratomalacia, pulsating exophthalmos, pituitary tumor, and recurrent vitreous hemorrhages were also considered indications for abortion and sterilization.

Frederick C. Cordes.

Knapp, Arnold. **Mucocele of ethmoid sinus.** Arch. of Ophth., v. 1, May, pp. 566-568.

Mucocele of the ethmoid sinus is rare. It manifests itself by protrusion of the eye, and in the author's case by drooping of the upper lid. The vision is impaired and paresis of the various extraocular muscles may occur. The nerve head is usually involved, as is the field of vision. The diagnosis has never been made previous to operation. The condition begins in early youth. Nasal symptoms are slight. Headache is frequent.

Operation on the ethmoid sinus reveals the condition. Large quantities of fluid are obtained, varying from clear and watery fluid to brownish-yellow fluid of thick consistency.

M. H. Post.

Koch-Herbert. **Malarial treatment of congenital lues in children.** Wiener klin. Woch., 1929, v. 42, March, p. 400.

Four cases are reported of children aged 3, 5, 10, and 12 years respectively, who showed positive Wassermanns on blood and spinal fluid after provocative treatment, and whose Wassermanns became negative after the malarial attacks. *Beulah Cushman.*

Lemoine, A. N. **Ocular anaphylaxis.** Arch. of Ophth., 1929, v. 1, June, pp. 706-711.

Allergic disturbances are found responsible for many varying types of ocular lesion. These allergies are, however, probably dependent upon abnormal endocrine function, most frequently of the thyroid, parathyroid, and gonads. Treatment should be directed towards restoration of proper function in these glands, and removal of the antigen is responsible for the allergy, or if this is impossible, the immunization of the patient towards this antigen.

M. H. Post.

Lotin, A., and Sukonshtshikova, A. **Tuberculosis of the eye and its treatment.** Russkii Opht. Jour., 1929, June, pp. 665-679.

After a review of recent literature on tuberculosis of the eye the authors relate their own experience in the management of three hundred and fifty-two cases of various ocular lesions due to tuberculosis. For diagnostic purposes they advocate the use of both Pirquet's and Mantoux's tests, but they warn against old-tuberculin hypodermic injections, because of the danger of severe general and local reactions. They report favorable results from tuberculin therapy, which was followed by definite improvement in 76.4 per cent of all cases treated. In the treatment of palpebral and conjunctival lesions they prefer Ponndorff's technique, while in tuberculosis of the eyeball the best results were obtained from the use of Kressling's tuberculin. Extreme caution is necessary in tuberculin treatment of paramacular choroiditis and of recurrent hemorrhages into the vitreous, since even a slight focal reaction is likely to cause irreparable damage. In some nontuberculous corneal lesions, for instance those of trachomatous or herpetic origin, the authors observed a beneficial effect of tuberculin therapy, possibly because of a coexisting latent tuberculosis.

General hygienic measures, ray-therapy, and the use of iron or gold preparations are also mentioned as assets in the treatment of ocular tuberculosis.

M. Beigelman.

Peters, H. **Metastasis in the eye from swine erysipelas.** Klin. M. f. Augenh., 1929, v. 83, July, pp. 25-30. (1 col. pl.)

A woman aged nineteen years, while preparing pork, punctured her right middle finger with a bone. The next morning she could not see well with her left eye. A week later she consulted a surgeon, who diagnosed erysipelas of the hand. The left eye showed deposits on Descemet's membrane and opacities of the vitreous, and its vision was reduced to counting fingers at one-half meter. A small artery running toward the macula was covered at regular intervals by vascular infiltration in the shape of white dots, as also were one upper and one lower artery. The veins were intact. At the macular region a gray prominence of 1.5 disc diameters was observed, with which a central scotoma corresponded. The condition gradually improved, and after eight months vision was 5/30 eccentrically. Although cultures from the blood remained negative, the author assumed metastasis by moderately virulent organisms of swine erysipelas.

C. Zimmermann.

Seissiger, J. **Eye findings in the newborn.** Arch. f. Augenh., 1929, v. 100-101, July, p. 302.

Seissiger examined the eyes of 500 newborn. The cornea was negative in every case. In the iris, blood vessels seemed very numerous; this may in part have been due to the lack of pigment in the iris at birth. In thirty per cent of the cases, remnants of the superficial bloodvessel network were still present. In ninety-five percent of the cases, remains of pupillary membrane rests were found. The color of the iris was always blue gray. No complete congenital cataract was seen, although 6.6 percent showed some small lenticular opacities. In examination of the fundi, nineteen percent of the children showed retinal hemorrhages; twelve were unilateral while in eighty-three both eyes were involved. The type varied from small striated to deep hemorrhages. In one case, the picture could not be differentiated from the picture of thrombosis of the central retinal vein.

Frederick C. Cordes.

Thaden, F. **Arachnodactylia (web fingers) with a review of the eye symptoms.** Arch. f. Augenh., 1929, v. 100-101, July, p. 278.

Thaden reports a case of arachnodactylia with its eye findings. In the right eye the lens lay in the center of the anterior chamber. It was rather small. The pupil was semidilated even under pilocarpin. The fundus was

rather hazy because of cloudiness of the vitreous. Retinoscopy showed myopia. The left eye had a luxated lens: this eye by retinoscopy showed a myopia of twenty-four diopters.

Of the twenty-three cases of this disease reported, twelve showed pathological eye changes. The most frequently observed change was luxation or subluxation of the lens, next came miosis. In one case a large cornea was reported, while in another there was a persistent pupillary membrane. In general the eyes were deep-set. A case reported by Pfaundlers was amaurotic.

Frederick C. Cordes.

18. HYGIENE, SOCIOLOGY, EDUCATION AND HISTORY

Golowin, S. S. **On progress in ophthalmology and its future accomplishments.** Zeit. f. Augenh., 1929, v. 68, May, p. 33.

An inspiration talk at the all-Russian congress of oculists in Leningrad, June, 1928. *F. H. Haessler.*

Hoorgina, E. A. **The action of light upon the eyes of cinema workers.** Russkii Opht. Jour., 1929, v. 9, April, pp. 441-449.

The author examined 205 cinema workers divided into the following three classes: 1, mechanics who handled the illuminating equipment, i.e.. the arc lights and mirrors; 2, directors and their assistants; 3, actors. He found a simple conjunctival congestion to be prevalent among the members of the first two groups, but he attributed that to irritation by dust in the studios. A follicular hypertrophy of the conjunctiva, which had a tendency to disappear after discontinuing the motion picture work, was present among the members of all groups examined and was due, in the author's opinion, to the action of the light rays. The most serious eye complication caused by the action of the arc lights was a superficial keratitis. This was found almost exclusively among actors, particularly the inexperienced ones, and was the result of direct and prolonged exposure to light.

M. Beigelman.

Lagrange, Henri. **Jules Badal.** Ann. d'Ocul., 1929, v. 166, May, pp. 353-356.

This is a brief biographical sketch.

Lawrence Post

Pesme, Paul. **Pierre Felix Lagrange.** Ann. d'Ocul., 1929, v. 166, April, pp. 257-260.

This is a short biographical sketch and tribute on the first anniversary of the death of this most distinguished man. *Lawrence Post.*

Rodin, Frank H. **Sight-saving classes in California.** California and Western Med., 1929, v. 30, April, p. 251.

This is largely a résumé of sight-saving work in California and especially of the classes that have been established in Long Beach, Los Angeles, Pasadena, and San Francisco. Those ordinarily eligible are high hyperopes, progressive myopes, children with nystagmus or corneal opacity, and those with corrected vision between 20/70 and 20/200. Rodin believes that more such children should be cared for in California, inasmuch as experience indicates that one in every 500 school children requires such a class. Ophthalmologists should report their candidates. (Bibliography.)

Ralph W. Danielson.

Shannon, Charles E. G. **Moving pictures as an aid in the teaching of ophthalmic surgery.** Penn. Med. Jour., 1929, v. 32, April, p. 487.

The use of moving pictures in teaching is being avidly accepted by medical students because pictures are interesting, lucid, entertaining, and accurate. If a patient is not at hand to illustrate a disease or a surgical operation, a picture is easily accessible. This is of especial value in eye surgery for "it is well known that a satisfactory view of any eye operation can be obtained by a very few—five or six men at the very outside." A page is devoted to the technique of making pictures of eye surgery. (Abstract of discussion.)

Ralph W. Danielson.

Shuman, G. H. **Biomicroscopy in industrial ophthalmology, medicolegal aspects.** The Pennsylvania Med. Jour., 1929, v. 32, May, p. 555.

Shuman points out that the advent of compensation laws has brought into the doctor and patient relationship a third party whose point of view is purely medicolegal. The ophthalmologist may be called upon for information which ordinarily is not necessary for the clinical management of the case. The author stresses the advantageousness of the biomicroscope in deciding between injury and disease, and whether an alleged injury is consistent with the findings. The method of sclerotic scatter is urged, inasmuch as it has been estimated that eighty percent of eye injuries resulting in defects of vision involve the cornea. Shuman discusses the differential findings in old or new lesions, cataracts, contusions, siderosis, chalcosis, and detection of early disease (usually of the same nature) in the other eye. The relation of malpractice to the biomicroscope is touched upon in discussion. (References and abstract of discussion.)

Ralph W. Danielson.

NEWS ITEMS

News items in this issue were received from Drs. C. A. Clapp, Baltimore; William Thornwall Davis, Washington; G. Oram Ring, Philadelphia; and Raymond J. Sisson, Detroit. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Oscar C. Breitenbach, Waukegan, Illinois, aged fifty-one years, died August fourteenth of pneumonia.

Edward Erskine Henderson, senior editor of the British Journal of Ophthalmology, died suddenly in Ireland about two months ago.

Miscellaneous

The British Journal of Ophthalmology calls attention to the fact that this year is the centennary of the invention of Braille reading for the blind. The inventor was a young musician, Louis Braille, born at Couvray near Paris in 1809. He had become blind at the age of three years. He published his system of raised dots in 1829, and fully developed it five years later.

It is becoming customary for each nation to claim for itself priority in the beginnings of every new discovery. An Italian journal recently attributed the first advocacy of phototherapy to a Sicilian, Dr. Sciascia, who in 1892 is said to have offered to the Societá Oftalmologica an important communication on phototherapy in eye diseases. The first important publication by Finsen, the Dane, on this subject was made at Leipzig in 1899. Sic transit gloria!

The prevailing opinion of those in attendance at the international congress in Amsterdam was that the entertainment was well carried out by our Dutch colleagues. But a letter from the professor of ophthalmology in a western medical college, after attending the congress, frankly voiced a criticism which has been heard from several ophthalmic physicians who were present. The criticism is to the effect that several important speakers delivered their addresses to their own bosoms, apparently ignoring the fact that a large audience was straining its ears to catch what they had to say. Unfortunately, no electrical loud-speaker equipment was provided. Our correspondent suggests that a presessional program of the papers, printed in English, French, and German, would have made such an international congress much more interesting and profitable.

On September thirteenth, after a two year survey of the blind population of the world, the League of Red Cross Societies made public in Paris a report recommending the formation of an international association for the prevention of blindness. A provisional committee to establish such a permanent body met in Scheveningen, Holland, on September fourteenth. A total blind population of 1,200,000 was indicated by the information available to the League of Red Cross Societies, but since this information represents less than half the total world's population, the blind population of the world was estimated at about 3,000,000. (Journal of the American Medical Association, September 21, 1929)

The nineteenth annual meeting of the Oxford Ophthalmological Congress, held at Oxford on July 4, 5, and 6, 1929, was conducted in the department of human anatomy of Oxford University, lent for the purpose by Professor Arthur Thomson, under the mastership of Mr. Bernard Cridland, who has been secretary of the Congress for the past sixteen years, and whose faithful work has been one of the most important factors in

the continued success of the Congress. The usual informal dinner was held July third in the Hall of Keble College. As in former years, each member of the Congress was assigned rooms as a student in Keble College. Among foreign members of the Congress were included Professor Joseph Meller of Vienna, Professor Lundsgaard and Dr. Holgar Ehlers of Copenhagen, Dr. Holland of Quetta, India, Dr. Bernard Samuels of New York, Dr. Thomas Poole of Washington, Dr. Swan of Evanston, Dr. Lichtenberg of Kansas City, and Dr. J. A. van Heuven of Utrecht. Twenty-three new members of the Congress were elected during the past year, and the total membership is now 411. The only representative of the United States upon the scientific program was Dr. Thomas Poole of Washington, D.C., who read a paper on "The effect of disease of the paranasal sinuses upon the fixation point". Dr. George Young of Colchester, England, and formerly of New York, was to have read a paper but was kept away by illness. The total attendance at the Congress was 112.

At the international congress in Amsterdam, the following representatives of the United States and Canada appeared on the scientific program:

Friday, September sixth, demonstration session: D. W. Wells (Boston), demonstration with phoro-optometer stereoscope; C. Berens (New York), ophthalmic ergograph; L. D. Green (San Francisco), a precision refracting instrument.

Friday, September sixth, papers by H. Friedenwald (Baltimore), the pathogenesis of acute glaucoma; by H. Friedenwald and H. F. Pierce (Baltimore), the pathogenesis of acute glaucoma.

Saturday, September seventh, papers by E. V. L. Brown and P. C. Kronfeld (Chicago), the refraction curve of eyes in the United States with special reference to changes in the first two decades; H. Morton (Minneapolis), thesis and argument for an hypothesis regarding so-called amblyopia ex anopsia; L. C. Peter (Philadelphia), amblyopia in concomitant squint; H. Barkan (San Francisco), the occlusion test for latent hyperphoria and its clinical results; C. Berens (New York), studies in ocular fatigue; D. W. Wells (Boston), some forms of oculomuscular anomalies; M. Cohen (New York), studies in intraocular metabolism; F. A. Davis (Madison), the rôle of lens antigen and uveal pigment in the production of hereditary eye anomalies.

Tuesday, September tenth, papers by A. E. MacDonald (Toronto), pathological anatomy of the retina and optic nerve; G. Oram Ring (Philadelphia), concerning the special value of the white and differential blood count to the ophthalmologist in the study of functional and organic symptomatology and as influencing the outcome of operative procedures; R. Kerry (Montreal), M. Uribe Troncoso (New York), gonioscopy, especially in glaucoma; J. S. Friedenwald (Baltimore), experimental studies on the permeability of the lens capsule, with special reference to the etiology of senile cataract; F. Garretson (Detroit), bacillus pyocyaneus infection of the cornea; Hanford McKee (Montreal), blastomycosis of the eye; A. C. Woods and A. M. Chesney (Baltimore), isolation of filterable agent in periodic ophthalmia .

Thursday, September twelfth, papers by A. J. Bedell (Albany), a stereoscopic photographic study of retinitis proliferans; Harvey Cushing (Boston), symposium on diagnosis of suprasellar tumors.

Societies

Dr. Meyer Wiener of Saint Louis and Dr. Joseph A. Stucky of Lexington addressed the annual meeting of the Indiana state medical association held recently at Evansville, Indiana, on "Some points on cosmetic surgery of the eye" and "Some unsolved problems in ophthalmology and otolaryngology", respectively .

The Colorado Ophthalmological Society held its October meeting at Colorado Springs.

The following are the officers of the Dallas Academy of Ophthalmology and Otolaryngology for the ensuing year: Dr. David L. Bettison, president; Dr. W. Wood Knowles, executive secretary; Dr. L. A. Nelson, recording secretary. The Academy meets at the Dallas Athletic Club, at six p.m. on the first Tuesday of each month from October to June. The November, January, and March meetings are devoted to clinical work.

Personals

Dr. John F. Curton, Minneapolis, announces the removal of his office to the Medical Arts building.

Dr. George Derby of Boston addressed the Interstate post-graduate medical meeting in Detroit in October.

Drs. Wm. C. Finnoff and Phillips Thygeson, Denver, announce the removal of their offices to the Republic building.

Dr. Wm. Zentmayer, Philadelphia, announces the removal of his office to the corner of Twentieth and Chestnut streets.

Dr. H. Robertson Skeel, New York City, announces the removal of his office to one hundred and fifteen east Sixty-first street.

Dr. Herman Scarney, formerly ophthalmic house surgeon at the Massachusetts Eye and Ear infirmary, is associated with Dr. Raymond Sisson in the David Whitney building, Detroit.

Dr. John W. Burke, Washington, D.C., has resigned as professor of ophthalmology at Georgetown University medical school and has been succeeded by Dr. James N. Greear, Junior.

Dr. David Webster of New York City, while in Vienna en route to the international congress at Amsterdam, lost his son from an acute attack of spinal meningitis.

According to the Canadian Medical Journal, Dr. Casey A. Wood is residing in Lon-

don for two years, preparing a catalogue with notes for the works on general biology and vertebrate zoology in the library of McGill university.

Dr. Albert E. Bulson, Jr., Fort Wayne, Indiana, recently addressed the Northeastern Indiana Academy of Medicine, Angola, on "Insidious blindness".

Professor Meller of Vienna has been elected an honorary life member of the Oxford Ophthalmological congress.

Professor Ernst Fuchs was the honor guest at a luncheon given in Amsterdam by Dr. George F. Suker of Chicago during the meeting of the Congress. About ninety guests sat down to one of the most beautiful luncheons it has ever been our privilege to attend. Speeches of Mr. Treacher Collins of London and Dr. George E. de Schweinitz of Philadelphia were followed by Professor Fuchs, who in a simple unassuming manner gave a most charming address.

The president of the Association of Military Surgeons for the coming year is Dr. (Brigadier General) W. H. Wilmer. Dr. Wilmer returned from the International Congress at Amsterdam only just in time to go to Denver for the thirty-seventh annual convention of the Association of Military Surgeons.

Among the foreign delegates to the Denver meeting of the Association of Military Surgeons was Dr. (Lieutenant Colonel) Daniel M. Velez, professor in the Mexican Military School and in the University of Mexico, and editor of the Anales de la Sociedad Mexicana de Oftalmologia y Oto-Rino-Laringologia. Dr. Velez made a two weeks stay in Denver as the guest of Dr. W. C. Finnoff. He subsequently attended the meeting of the American College of Surgeons in Chicago, and was later an honor guest of the convention of the Association for the Prevention of Blindness, in Saint Louis, Missouri.

The newspaper columns of Duluth, Minnesota, have recently contained a good deal of correspondence with regard to the idea of making all declarations of war subject to a popular referendum. The newspaper editorials have frequently referred to the fact that Dr. T. H. Shastid's previously published works played an important part in promoting this idea; and Dr. Shastid has also taken part in the extensive correspondence which has recently been stirred up in the newspaper columns.

The Wilmer Institute

Another page has been written in the story of the rapid advance which is being made by the United States in ophthalmological teaching and research. On Tuesday and Wednesday, October 15 and 16, 1929, the Wilmer Ophthalmological Institute, associated with the Johns Hopkins University and the Johns Hopkins Hospital, was officially dedicated by President Joseph S. Ames of the Johns Hopkins University, and inspected by numerous visitors from all parts of the United States who also had the momentous opportunity of listening on those two days to three of the world's most distinguished ophthalmologists, Hofrath Ernst Fuchs of the University of Vienna, Dr. George E. de Schweinitz of the University of Pennsylvania, and Sir John Herbert Parsons of the University of London.

The policy of the Institute is to become "a gradually expanding source for the direction of ophthalmological thought in America along the lines of therapeutics, research, and training of teachers". The Institute is a monument erected by a large group of patients and friends in appreciation of Dr. William Holland Wilmer. In 1922 this group incorporated the William Holland Wilmer Foundation for the purpose of "establishing and endowing and, if necessary, maintaining and conducting an institution for the care, treatment, and surgery of the human eye, as well as research in the field of medical science as it relates to the eye". In January, 1925, the General Education Board contributed $1,500,000 toward a fund of $3,000,000 for founding the Institute, the balance of the total sum being secured by the Foundation and the Johns Hopkins institutions.

The Institute now serves as the eye clinic of the Johns Hopkins Hospital and department of ophthalmology of the Johns Hopkins University. A limited number of young graduates in medicine are afforded the opportunity, as resident or interne, and under Dr. Wilmer's direction, to acquire a fundamental training in the science and art of ophthalmology.

Among the special research problems in which Professor Wilmer's associates have already engaged are special studies on glaucoma by Dr. Jonas S. Friedenwald and Dr. Harold F. Pierce; investigation of the immunological factor controlling precipitation of lens protein fractions, by Dr. Alan C. Woods; an inquiry into the action of the lens capsule as a dialyzing membrane, by Dr. Jonas S. Friedenwald; and an analysis of the causation of periodic ophthalmia of horses, by Dr. Alan C. Woods.